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RESEARCH, EDUCATION, AND ECONOMICS (REE)

LONG-RANGE INFORMATION RESOURCES MANAGEMENT PLAN

Fiscal Years 1998 - 2002



Prepared by

Agricultural Research Service (ARS)
&
National Agricultural Library (NAL)

Cooperative State Research, Education, and Extension Service (CSREES)

Economic Research Service (ERS)

National Agricultural Statistics Service (NASS)

JULY 1997

United States
Department of
Agriculture



NATIONAL
AGRICULTURAL
LIBRARY

Advancing Access to
Global Information for
Agriculture

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CHAPTER I

Research, Education, and Economics (REE)

REE Long-Range IRM Plan FY 1998 - 2002

A. REE INTRODUCTION

REE Mission Area

The Research, Education, and Economics (REE) mission area is assigned Federal leadership responsibility for the creation and dissemination of knowledge spanning the biological, physical, and social sciences related to agricultural research, economic analysis, statistics, extension, and higher education. REE is one of the seven major divisions of the U.S. Department of Agriculture (USDA). Through its programs, REE enhances the U.S. position as a global leader in a highly competitive food and fiber system; promotes sustainable agricultural practices in harmony with the environment; and contributes to continued agricultural prosperity, thriving rural communities, and well-informed consumers.

The historical effect of the REE agencies' programs reflects the importance of science, technology, economics, and statistical information to the U.S. agricultural sector. Without gains in agricultural science, the United States cannot continue to provide affordable, safe, and nutritious food to American consumers; enhance farm income; compete effectively for export markets; and mitigate the effects of agriculture on the environment. These science and technology programs encourage States to invest in research; many Federal programs augment state funds. Publicly supported research spurs private sector investment in science and technology and provides information that supports decision making and a free market system.

Agencies of the REE Mission Area

The four key USDA agencies, under the leadership of an Under Secretary, that implement the research, education, and economics mission are the Agricultural Research Service; the Cooperative State Research, Education, and Extension Service; the Economic Research Service; and the National Agricultural Statistics Service. These agencies have unique missions, but also interact and cooperate in the work they do.

The Agricultural Research Service (ARS) is the principal in-house physical and biological science research agency in USDA dedicated to solving high-priority agricultural problems through research and information access and dissemination. Research solutions ensure high-quality, safe, and affordable food and other agricultural products to meet the needs of the American consumer; sustain a viable and competitive agricultural economy; contribute to public understanding of the human health effects of food; and expand economic opportunities for rural residents and all Americans while maintaining the Nation's environmental and natural resource base.

The Cooperative State Research, Education, and Extension Service is the Federal partner in the USDA-supported system of extramural scientific research, higher education, and Extension in the

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United States. The mission of CSREES is to benefit people, communities, and the Nation through efforts with its partners and customers to advance research, Extension, and higher education in the food and agricultural sciences, related environmental and human sciences and rural development. CSREES seeks to achieve, through interdisciplinary teamwork and collaboration, significant and equitable improvements in economic, educational, environmental, and social conditions in individuals, communities, States, and territories.

The Economic Research Service (ERS), USDA's principal intramural social science research agency, provides economic and other information and analysis for public and private decision making relating to agriculture, food, natural resources, and rural development.

The National Agricultural Statistics Service (NASS) provides the official USDA production, economic, and environmental forecasts and estimates on agriculture and rural America. The mission of NASS is to serve the United States, its agriculture and its rural communities by providing meaningful, accurate, and objective statistical information and services.

REE Mission

The Research, Education, and Economics mission area of USDA is dedicated to the creation of a safe, sustainable, competitive U.S. food and fiber system and strong, healthy communities, families, and youth through integrated research, analysis, and education.

REE Vision

The Research, Education, and Economics mission area is the catalyst and premier provider of knowledge to promote the well-being of U.S. consumers, agricultural producers, and rural residents.

REE Functions

The agencies conducting the REE mission area programs perform five primary functions:

- Create basic research knowledge at the frontiers of the biological, physical, and social sciences;
- Produce, apply, and adopt applied research-based knowledge in innovative ways to address problems and issues;
- Produce developmental research results and promote the commercialization and transfer of technologies and practices to potential users in a timely, cost-effective manner;
- Provide leadership in the delivery of research-based knowledge through Extension, outreach, and information to strengthen the capacity of public and private decision makers;

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and

- Strengthen capacity of institutions of higher education to develop the skills of the Nation's workforce.

REE Strategic Objectives

The REE mission will be accomplished through programs that create and disseminate knowledge necessary for achieving the five basic strategic objectives. These strategic objectives are derived from the broad public debate that codified the purposes for agricultural research in the 1990 and 1996 laws reauthorizing the Department's research, education, and Extension programs.

REE Agency Mission Statements

ARS

Provide access to agricultural information and develop new knowledge and technology needed to solve technical agricultural problems of broad scope and high national priority to ensure adequate availability of high-quality, safe food and other agricultural products to meet the nutritional needs of the American consumer, to sustain a viable and competitive food and agricultural economy, to enhance quality and life and economic opportunity for rural citizens and society as a whole, and to maintain a quality environment and natural resource base.

CSREES

Work with partners and customers to advance research, extension, and higher education in the food and agriculture sciences and related environmental and human sciences to benefit people, communities, and the nation.

ERS

Provide economic and other social science information and analysis for public and private decisions on agriculture, food, natural resources, and rural America. A program of economic and social science research, analysis, and data dissemination supports decisions by the Executive Branch, the U.S. Congress, environmental consumer and public interest groups, including farm and industry groups, and the general public.

NASS

Serve the United States, its agriculture, and its rural communities by providing meaningful, accurate, and objective statistical information and services.

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B. REE IRM PLANNING PROCESS

REE Strategic Plan

A five year strategic plan has been developed that guides REE into the 21st century. The plan along with annual performance plans constitute the REE response to the Government Performance and Results Act (GPRA), and is used to communicate REE programs and priorities to employees, customers, partners, and other constituents. The outcomes and goals serve as guides to development of the annual performance plans, which will be monitored to ensure that REE programs and resources stay focused and relevant.

New developments in computer, communication, and related technologies have made it possible to transmit information almost anywhere in the world in a variety of data formats, in addition to image, voice, and video. Agencies in the REE mission area are both major creators and users of new technologies. Access to information technologies is key to organizational and program success. REE agencies must plan to acquire and use these available technologies to strengthen their ability to achieve goals more effectively and efficiently. A major issue facing the mission area in implementing this plan is the availability of investment funds for the purchase and implementation of these new technologies. Because the long-term payback from technology investments is significant, the REE mission area will develop an acquisition plan during the five year strategic plan.

C. CURRENT IRM ENVIRONMENT

ARS, CSREES, ERS, and NASS have retained functional responsibility and the resources to develop and operate their unique information management systems and technology needs. Therefore, each Agency has prepared its own IRM plan as a component to the overall REE mission area for this planning cycle. ARS functions as the lead Agency for administrative support services and coordinates its administrative and financial systems plans with the other REE agencies.

D. FUTURE DIRECTION

The Federal Agriculture Improvement and Reform (FAIR) Act of 1996 requested the Secretary of Agriculture to conduct a comprehensive review of state-of-the-art information technology systems and develop and implement a system to monitor and evaluate agricultural research and extension activities conducted or supported by the Department of Agriculture (USDA).

Accordingly, the Cooperative State Research, Education, and Extension Service (CSREES) has

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been designated to organize and coordinate efforts of REE agencies and their state and private partners in planning, designing, developing, and implementing a comprehensive Research, Education, and Economics Information System (REEIS). Ultimately, it is envisioned that REEIS will operate as a platform to link/interrelate many different databases serving extension, research, education, economic, and other REE agency functions. The Science and Education Resources Development (SERD) Division of CSREES has been given day-to-day management responsibilities for charting the course for REEIS.

CHAPTER II

Agricultural Research Service (ARS)

ARS Long-Range Narrative

ARS Long-Range IRM Plan FY 1998 - 2002

A. ARS INTRODUCTION

Organizational Structure:

The ARS consists of 103 domestic research locations which support 1,200 research projects. Each location reports to one of eight Area Directors. Each Area Director manages research programs across a multi-state geographic area. Each Area Director reports to the Administrator of ARS. In addition, there are two foreign research locations which report to the Assistant Administrator for the Office of International Research Programs (OIRP) who reports to the Administrator of ARS. There are 6687 permanent ARS employees with approximately 213 specialists involved in information technology systems.

ARS Approach to GPRA

Since 1983, ARS has developed a series of multi-year strategic plans to help guide development and management of the agency's work. In 1993, the Government Performance and Results Act (GPRA), Public Law 103-62, was enacted. It seeks to make all Federal departments and agencies more programmatically accountable to Congress and the U.S. taxpayers. ARS has developed a Strategic Plan, covering fiscal years 1998-2002, in accordance with GPRA requirements.

Using input and information gathered, ARS identified 10 major issue areas that will affect agriculture and agricultural research over the next 25 years.

- International/Global Issues
- Population/Demographics Issues
- Environmental Issues
- Sustainability Of Production Systems Issues
- Economic Issues
- Government And Political Issues
- Consumer/Societal Issues
- Food and Health Issues
- Technological Advancement Issues
- Education And Information Issues

In analyzing the input and information gathered at five conferences, nine major roles were identified for ARS in meeting the research needs of the next 25 years. The nine roles are as follows: provide leadership in the agricultural research agenda; strengthen relationships with ARS partners; educate and relate to consumers and other constituents; develop and transfer information systems and technology; carry out and support strong, relevant science; focus on long-term, high-risk research; address environmental issues; promote interdisciplinary team and systems approaches; and develop and strengthen institutional and human resources.

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The ARS guiding principles are based on the input and information gathered at visioning conferences. In addition, the visioning process provides a broad thematic framework that runs throughout the ARS strategic plan. Shortly after the visioning process was completed, the agency established a Strategic Planning Team (SPT) charged with drafting a new ARS strategic plan to meet the GPRA requirements.

ARS Strategic Planning Process

The SPT obtained input from the Agency's senior managers throughout the drafting process. As required by GPRA, the SPT sought comments from ARS employees, customers, stakeholders, partners, the general public and the USDA Office of the Chief Financial Officer (CFO). The draft plan was made available on the ARS Home Page and in the Federal Register. The SPT received positive, substantive, and thoughtful comments that were helpful in finalizing the strategic plan.

ARS Management Structure

ARS consists of two management components: Program Management (PM) and Administrative and Financial Management (AFM). The ARS Administrator has two Deputy Administrators.

- The Deputy Administrator, National Program Staff (NPS), is responsible for planning and directing the research programs of the Agency on behalf of the Administrator.
- The Deputy Administrator, AFM, directs the administrative and financial programs of the Agency through six Division Directors.

The Agency organizational chart (Exhibit 1) displays the organizational alignment.

Program Management (PM)

PM establishes and coordinates many research programs using various technology. PM operates in a highly advanced decentralized environment with heavy usage of Internet E-mail to communicate with colleges and universities.

Administrative and Financial Management (AFM)

Under the departmental reorganization of 1994, each mission area was required to consolidate all of its administrative and financial management activities. In the REE mission area, the Agricultural Research Service was designated as the lead agency providing administrative and financial management services to the Office of the Under Secretary and the four REE

Recommended: *Ed F. Bion*

Administrator

General:

Ed N. Galt

Under Secretary for R & E

Approved:

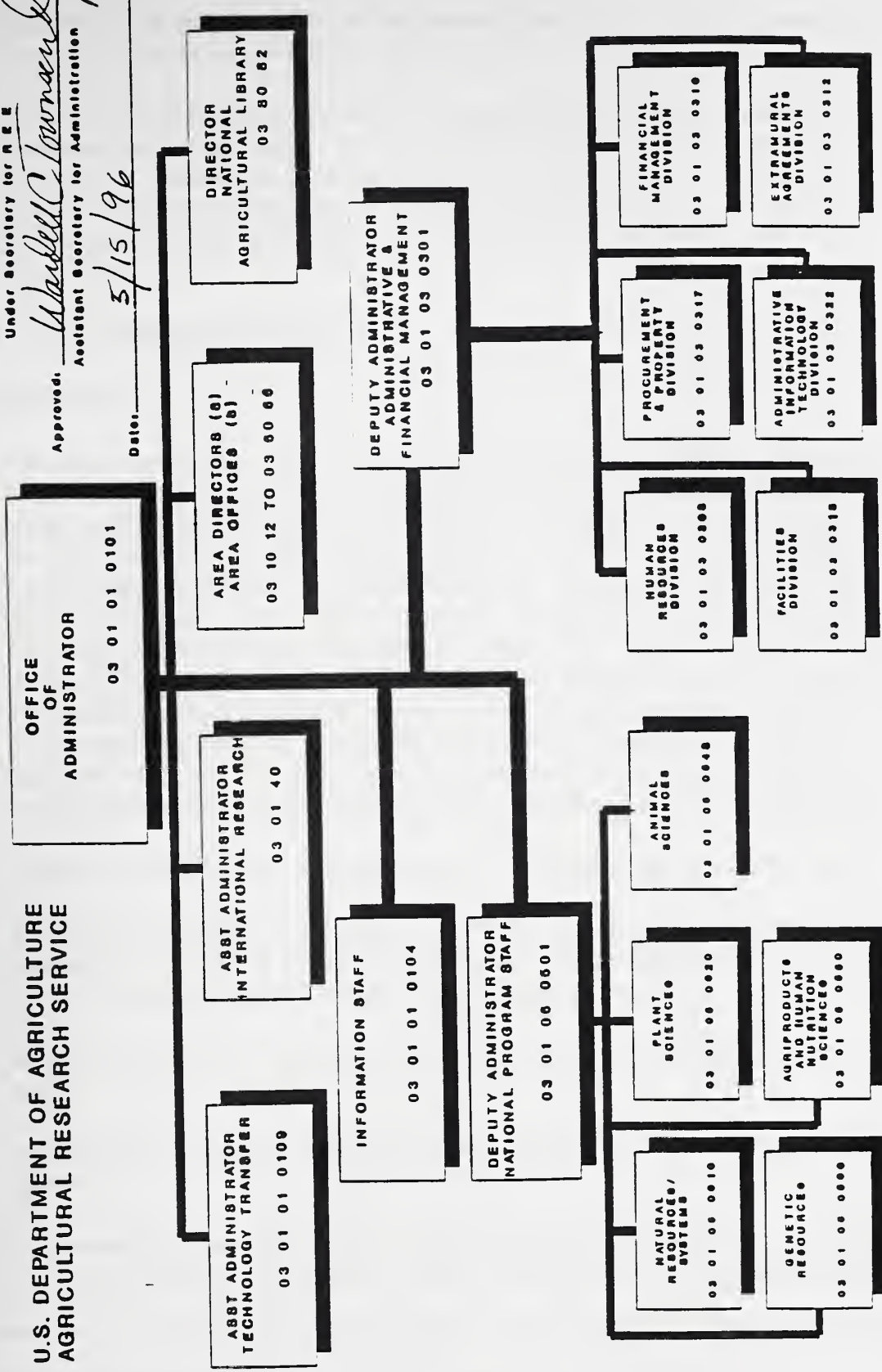
Walter C. Townsend

Assistant Secretary for Administration

Date:

5/15/96

U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL RESEARCH SERVICE



MISSION: Provide access to agricultural information and develop new knowledge and technology needed to solve technical agricultural problems of broad scope and high national priority to ensure adequate availability of high-quality, safe food and other agricultural products to meet the nutritional needs of the American consumer, to sustain a viable and competitive food and agricultural economy, to enhance quality of life and economic opportunity for rural citizens and society as a whole, and to maintain a quality environment and natural resource base.

SUPERSEDES CHART DATED 12/28/92
Prepared by: ARS HRD Systems Staff

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Agencies. This support includes human resources, procurement, property, accounting, telecommunications and records management.

The ARS Administrative and Financial Management staff developed a strategic plan, based on customer in-put from all four REE agencies, detailing how services will be provided. For that reason, the strategic plan focuses on the ARS research programs and closely related activities. The AFM strategic plan links to the ARS strategic plan. Both the IRM and the AFM strategic plans are important to the research priorities outlined in ARS' Six Year Program Plan.

1. PROGRAM MANAGEMENT

Introduction

The ARS provides leadership and conducts basic and applied research at federal laboratories to solve problems encountered by agricultural producers and consumers of farm and ranch products. Traditionally, agricultural problems have been solved through research involving the collection of data for individual components of a system, such as soils, plants, livestock, insects, chemicals, climate, marketing, technology, and quality factors. However, complete agricultural systems are so complex that evaluating them by direct measurements and narrowly focused analysis is not practical or meaningful. Today, data must be assembled into models of systems that can account for the interactions among components and multiple affects among many components. For this reason, many ARS research programs include efforts to develop computer models that can be used to simulate the interactions within an agricultural system. The research also includes experiments designed to determine and understand the relationships needed to drive the models and to test and confirm their validity.

Primary Research Program Categories. Current broad areas of emphasis include:

- 1. Soil, Water and Air.** Research on conserving and wisely managing our soil, water and air resources to minimize the effects agriculture has on the environment while keeping costs to the consumer low and profits to the farmer as high as possible.
- 2. Plant Productivity.** Research on making crop plants more productive and of better quality.
- 3. Animal Productivity.** Research to improve productivity, health and well-being of farm animals.
- 4. Commodity Conversion and Delivery.** Research that finds better ways to convert raw agricultural commodities into food, textiles, industrial materials, and other products and

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deliver these goods to consumer and export markets.

5. Human Nutrition and Well-Being. Research that promotes health and quality of life through a better understanding of what nutrients are in foods, how nutrients work in humans and what nutrients we need, and which nutrients we actually get in the foods we eat.

6. Systems Integration. Integrating scientific knowledge into systems that help Americans make the most of our resources and enable the transfer of technology from laboratory to farm.

7. Information and Library Services. The goal is to ensure and enhance access to agricultural information for a better quality of life through the programs of the National Agricultural Library (NAL) - the library of the Department of Agriculture and the primary agricultural information resource of the Nation.

Planning Processes

ARS Program Plan

ARS developed a 6-year Program Plan which serves as the business plan. Agency IRM functions and activities are oriented to support this Plan. Objective 6 in this Plan specifically directs integrating scientific knowledge of agricultural production, processing, and marketing into systems which use resources optimally and facilitate the transfer of technology to users.

ARS Resources Management System (ARMS)

As part of the ARMS implemented through Annual Resource Management Planning System (ARMPS), all ARS managers develop yearly plans for how their resources (facilities, equipment, personnel, extramural agreements) are to be used to support Agency priorities. More specifically, each location develops its resource requirements. The nature of the research being performed in support of the Program Plan determines the type of resources needed. The formulation of major research plans identify the specific computing resources. The Administrator annually reviews each location's research activities and resource requirements with the National Program Staff and other advisors during the first month of the fiscal year. The need for computing resources is included in this review. These plans are reviewed by their supervisors and approved in final by the Administrator of ARS. The results of this review translate into an approved funding plan for the fiscal year.

Major Research Systems

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ARS has increased research emphasis on promoting an environmentally-sensitive agriculture and supporting the development of new knowledge which addresses critical issues in food safety. Primary research programs emphasize water quality, global change, new biological controls, integrated pest management strategies, and alternative fuels production.

Germplasm Research Information Network (GRIN):

The mission of the GRIN is to provide support to the national research programs whose missions are to acquire, maintain, evaluate, utilize, and make available to scientists a wide range of economically important plant, animal, microbial, insect, and forest trees germplasm. This germplasm provides the genetic diversity necessary to improve agricultural productivity to reduce genetic vulnerability in future food and agriculture development. The germplasm is maintained by networks of cooperating institutions, agencies, and research units in the federal, state, and private sectors with ARS providing the national leadership. The GRIN database accumulates information about the preserved germplasm. It provides an automated retrieval capability for the collection and dissemination of germplasm information to scientists who are the users of the germplasm, and to managers and collection curators.

Global Climate Change Research Program:

The goal of this program is to develop a comprehensive model for the land-based biosphere component of the Earth as an integrated system comprising land, ocean, and atmosphere. The model is a means of understanding how both natural and human-induced processes will cause future environmental changes. As implied by its purpose, the development of the model will require complex integration of different types of data from many sources. The information will be the basis of designing response strategies that secure the continued productivity and health of human life-support systems. The U.S. Congress directed the Department to contract this data assessment (Ref: Agriculture, Rural Development, FDA and Related Agencies 1992 Appropriations Bill-Conference Report - H.R. 102-239).

Animal Improvement Program Laboratory (AIPL):

The mission of the AIPL is research, development, and verification of sophisticated procedures for genetic evaluation of dairy cattle based on nationwide data obtained through the National Cooperative Dairy Herd Improvement Program (NCDHIP). Research is directed at genetic improvement of yield of milk and non-yield traits that affect the health, vigor, longevity, and profitability of dairy cattle.

Plant Genome/Animal Genome Mapping Programs:

These related programs are essential for the U.S. to maintain and strengthen a strong global

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position in agricultural efficiency and profitability. In this initiative ARS is responsible for providing Federal leadership in developing the program to provide a comprehensive picture of what genes are present in plants, their arrangement within chromosomes, what traits they control, and how they function.

Researchers will eventually complete the gene mapping of plant species of economic importance. Methods for collecting and validating data, and supporting users of the information will have to be developed. Much of the project will be accomplished extramurally with coordination and program management by ARS. The National Agricultural Library operates the database system. Eventually, scientists will have access through a network to more intensively coordinated plant gene mapping initiative. The gene mapping program will be closely integrated with the ARS germplasm program.

Current PM IRM Environment

Information Technology for Research

Virtually every research project, to one degree or another, involves some facet of management of information resources. Often, new systems are an essential response to new missions or program redirections; thus more sophisticated computer capabilities evolve as research programs evolve. Early successful use of automated systems, often generate the need for additional computing resources, thus enhancing the results of research projects.

Throughout the ARS research laboratories, specialized state-of-the-art computer capabilities such as data acquisition devices, statistical computing, scientific graphics, decision support systems with imbedded expert systems, and simulation modeling programs facilitate and enhance research projects. The nature of the research being performed will determine the type of computing resources needed at each location.

Application Strategies

ARS researchers readily identify situations where their research would benefit from the application of computer technology. They have a wide range of information resource needs. Some researchers have a modest need consisting of a personal computer to do word processing for manuscripts, correspondence, and some record keeping. At the other extreme, our researchers are involved in more computing intensive activities such as modeling, statistical analysis, and maintenance of complex research databases. Scientists are continually exploring new technologies as part of their efforts to remain on the cutting edge of research.

ARS relies heavily on the private sector for new automation technologies which can be used

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in its research efforts. ARS seeks to maximize the use of existing technologies as well as newly emerging ADP technology to enhance agricultural research both now and in the future. ARS uses personal computers (PCs) in headquarters, area, and field offices. ARS offices use local area networks and modern private branch exchange (PBX) telephone equipment.

The ARS Research Program Plan concerns the development of improved ways for integrating scientific knowledge of agricultural production, processing, and marketing. The Program Plan calls for increased emphasis on integrative systems research and describes the emphasis on databases for improving evaluations of nutritional status, and assimilation/integration of biological and physical research data into systems for analyzing complex interactions of two or more research areas, for example, animals, plants, and environments. The IRM strategies support this objective.

IRM and Research Programs

National Program Staff (NPS):

The NPS maintains a database of information on research program activities and accomplishments.

Budget and Program Management Staff (BPMS)

BPMS maintains and distributes information on ARS budgets and program allocations.

Office of Technology Transfer (OTT):

This office maintains a database on ARS scientific accomplishments which is accessed by Government and non-Government users.

Future Research IRM Direction

ARS will continue to seek to improve its capability to manage its research activities. ARS will seek to develop agency wide databases which integrate all relevant program and administrative management data. The evolution of ARS programs toward larger, more interdisciplinary and cross-cutting programs requires integrated databases and management information systems.

ARS research planning is based on problem identification: specification of goals, objectives, and expected outcome; identification of gaps in knowledge that impede solution of specific problems. To integrate these factors, ARS will use systems-based decision methods such as decision trees and critical path analysis.

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ARS needs systems that optimize resource management and facilitate transfer of technology to users. ARS information systems must provide useful, accurate information in support of program decisions and effective resource utilization. This will demand functional information management which is both comprehensive and responsive to change. There is a constant need to provide researchers with appropriate IRM tools. Researchers are enthusiastic about applying the capabilities of automation to facilitate and enhance their work. Successful systems accomplishments are shared with colleagues who are interested in the technology.

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2. ADMINISTRATIVE AND FINANCIAL MANAGEMENT

IRM Organization

The Administrative Information and Technology Division (AITD) provides systems development, information management and technical support for telephone/voice, records management, copier management, policies and procedures, forms management, mail and distribution management, and related paperwork management functions to the REE agencies.

The Division organizational chart (Exhibit 2) displays the new organizational alignment.

CSREES, NASS, and ERS retained technical information technology support for their unique program missions.

ARS Support

AITD's mission also includes providing customer-focused administrative information resource management services to ARS, in the areas of systems design, systems development, hardware and software support, communications, records, forms, mail management, and directives, and related activities.

IRM Leadership

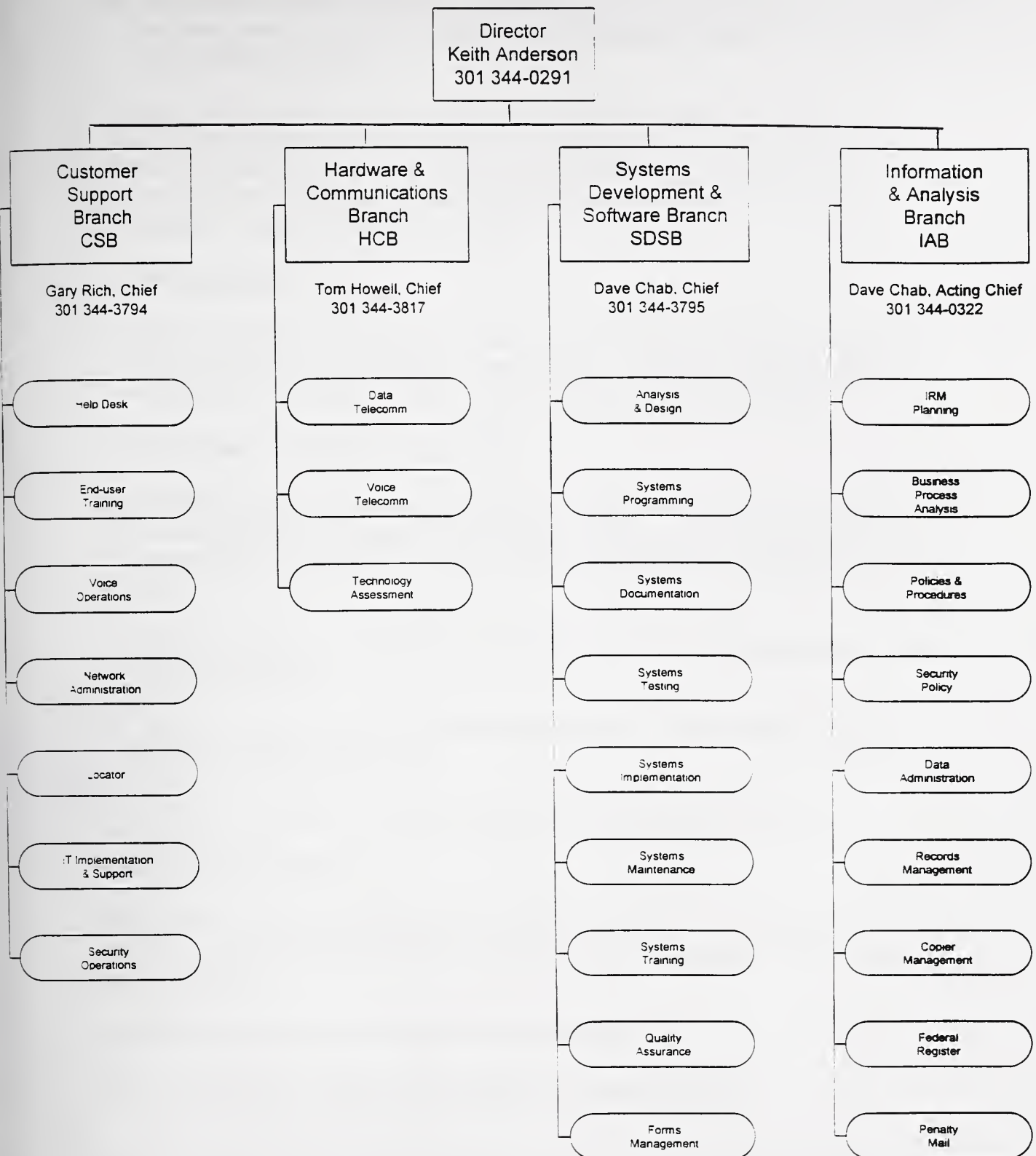
The IRM functions are led by Keith W. Anderson, Director, AITD, who reports to the Deputy Administrator, Administrative and Financial Management. Mr. Anderson serves as the ARS Senior IRM Official (SIRMO) and is a member of both the REE/IRM Advisory Council and AFM Council.

AITD Strategy Plan

Under the Government Performance and Results Act, a strategic plan has been developed for accomplishing its mission; and, achieving the information management objectives requires a planned and orchestrated set of activities in the following areas:

- Implementing a comprehensive, integrated technical infrastructure and architecture including a state-of-the-art computing, network, and telecommunications infrastructure;
- Expanding state-of-the-art office automation technologies;
- Promoting REE-wide computer literacy through training and education; and

Administrative Information & Technology Division
Functional Assignments
1998



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- Implementing Quality Partnership, formally TQM, based customer service to support end users working with the current technical infrastructure and software applications truly integrated systems.

Whenever appropriate, the Agency will rely on contractor support to identify and test relevant new technologies for scientific and administrative system applications. These efforts will include expanded use of new technologies such as networking facilities, client server, database management systems, and automated text storage and retrieval technologies as well as innovative software.

AITD Organization

AITD has four branches which are intended to provide more flexible and streamlined resources and support an environment characterized by constant change in needs and capabilities. Specific IRM responsibilities of these units are described below.

Hardware and Communications Branch

The Hardware and Communications Branch researches and develops new technologies in telecommunications, networking, and hardware. This includes: voice and data communications, Local Area Networks, Wide Area Network, and hardware analysis for REE.

This Branch evaluates and implements hardware, software and office automation services to customers including:

- Support for voice, data, and video telecommunications and local and wide area networks systems support; and
- Support for installing and implementing hardware and standard software.

Customer Support Branch

The Customer Services Branch provides technical support services primarily to customers in AFM, with some support to others in ARS and the REE agencies. This Branch is responsible for:

- Hardware and software support and troubleshooting;
- Voice and phone communications support and troubleshooting;

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- LAN/WAN administration and support;
- User training;
- Security Operations;
- Hardware, software, and telecommunications implementation;
- Planning and coordinating IT procurements;
- Customer communications;
- Quality control; and
- Electronic mail administration and support.

Systems Development and Software Branch

This Branch is responsible for systems analysis, design, and programming for REE administrative systems. Assigned computer specialists determine the nature of requirements, logical work, information flows, and analyze advanced systems technologies applications. In fulfilling this responsibility the Branch performs the following general functions:

- Develops quality assurance standards;
- Designs, modifies, and maintains national administrative systems;
- Tests and evaluates software;
- Provides database management oversight and management;
- Defines policies and procedures for the development of national automated systems; and
- Develops REE electronic forms.

Information and Analysis Branch

This Branch is responsible for leading and coordinating the general aspects of information management for REE. The Branch:

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- Leads the Mission Area's information engineering initiatives;
- Coordinates the development and prepares the REE's annual Long-Range IRM Plan;
- Maintains the REE records, mail, copier, policies and procedures, forms and paperwork management functions;
- Formulates the ARS ADP/IRM budget information;
- Develops and oversees the ARS Information Systems Security Program; and
- Formulates and implements ARS IRM policies and standards.

Other IRM Support Units:

Headquarters AFM Divisions

Headquarters AFM divisions lead the development of automated and other information processing systems in their functional areas.

Property and Procurement Division

This Division supports contracting and acquisition processing for information technology resources. Assists in developing final, detailed specifications for major ADP acquisitions.

Area Administrative Offices (AAO's)

Area Computer Specialists (ACS) provide computer expertise to the Area Offices and to their assigned field units in implementing and administering National systems.

B. IRM PLANNING PROCESS

IRM Planning

AITD prepares the ARS Long-Range IRM Plan. Key agency managers and functional specialists are interviewed to determine the status of their information resource initiatives. The IRM Plan keeps senior management aware of progress on specific information systems. This plan addresses the needs for providing ongoing administrative support to REE programs and the continued development of effective administrative and financial systems.

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AFM Council

This Council serves as a senior advisory group to the Deputy Administrator, Administrative and Financial Management (DAAFM), to improve resource allocation decisions. Members of the Council are the AFM Division Directors, two Area Administrative Officers (AAO's), and the coordinator of the Consolidated Assistance, Review, and Evaluation Program (CARE). The Council:

- Develops and maintains an awareness of the IRM needs of administrative functions at all organizational levels;
- Reviews all proposed automation initiatives which affect more than one organizational unit, develops recommendations for approval, and monitors the status of approved initiatives;
- Provides recommendations on the development of the Long-Range Plan;
- Reviews progress and AFM support requirements for Departmental information technology initiatives such as the Modernization of Administrative Processes (MAP) and Financial Information Systems Visionary Strategy (FISVIS).
- Promotes the timely sharing of IRM information across all administrative and financial activities;
- Assures the inclusion of timely training of end users in all system development activities; and
- Facilitates an ongoing dialogue with PM on cross-cutting IRM issues.

C. CURRENT IRM ENVIRONMENT

The establishment of system inter-connectivity is essential to support the consolidated administrative support services provided by AFM to ARS. Emphasis continues to be placed on national systems which support the program goals and objectives. ARS uses the National Finance Center's (NFC's) databases as its official database except where unique internal requirements dictate otherwise.

Control and coordination of agency-wide information systems requirements are being achieved through standards and standardized hardware/software, the development of data dictionaries, maintenance of software libraries, training of system users, and the allocation of IRM resources according to management priorities.

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System Platforms/Technology

Personal computers (PC's) are the principle automation technology tools in use. All ARS headquarters, areas and locations have computing and data communications capabilities through PC's. All of ARS is linked to the FTS2000 network. Each year more users are transmitting data files and accessing databases at facilities inside and outside the agency.

Local Area Networks (LAN) and Wide Area Network (WAN)

In AFM, a Novell LAN supports AFM in Greenbelt and Washington, D.C. Complexes. The system consists of ten file servers, three cluster controllers, two modem pools, and four X.25 Gateways to NFC and the National Computer Center (NCC). The system is fiber optic. The LAN is part of the agency WAN ARSNet which includes all ARS Area Administrative Offices and the National Program Staff.

E-Mail

The e-mail infrastructure uses Novell's GroupWise electronic mail, and is linked between headquarters and the Area Offices. All REE agencies are linked through e-mail communication; using GroupWise, FTS2000 Mail, and Internet.

Telecommunication

Telecommunications will continue to be a area of major emphasis for ARS. Employees will have increased access to information and will be sharing data across the agency as well as with other organizations. ARS expects to increase high speed access to databases in support of researchers and other specialists, to expand its use of local and wide area networks as well as to increase its information-sharing capability. Security will also receive increased upgrades and functionality.

System Development and Information Engineering

ARS uses business process analysis and reengineering techniques in the program and resource management areas. It also maintains an information strategy plan and a business architecture. There are plans to reassess the ARS components of the REE Information Strategy Plan (ISP) completed in 1994. The ARS IT Steering Committee will evaluate the progress and accomplishments toward recommendations of the 1994 ISP, verify the applicability of recommendations to the current environment, and modify or extend the plan as needed.

Existing and legacy systems supporting the program and resource management business

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processes need to be reengineered according to the requirements developed and documented in the business architecture. Specifically, the Research Management Information System (RMIS) and the ARS Resource Management System (ARMPS) need to reflect new business processes and a modernized technical environment.

Satellite Network

AITD uses a Satellite Downlink Network within ARS, AM, area offices and locations. This network provides a cost-effective training mechanism accessible to all employees. Training mandated for all employees are Sexual Harassment, Aids in the Work Place, and Ethics. The network transmits messages to all employees concerning retirement planning, management training, and messages from the Secretary of Agriculture. This program has saved the agency significant in-class training and travel costs.

D. ACCOMPLISHMENTS

One of the major challenges in the coming years includes development of more cost-effective means to interface with the NFC. ARS is supporting the development of integrated administrative systems through the following accomplishments:

- Expansion of the USDA Demonstration Project authority to all ARS locations which eliminated the need for OPM examining services.
- Development and transmission of satellite training courses for extramural agreements that reached 240 participants nationwide and saved nearly \$350,000 by using this method of training.
- Optimization of selected ARS and NASS FTS2000 voice and data circuits.
- Conversion of ARS and NASS field commercial and state telephone lines to FTS2000 On-Net by providing virtual-on-net (VON) long distance service.
- Implementation of ARSNet WAN at 11 backbone sites for inclusion of E-mail, Research Management Information System (RMIS) access, and Internet access.
- Full implementation of the National Finance Center's (NFC) automated TRAV system within ARS, including NAL, and promoted use of the system within REE community resulting in fewer data errors and quicker processing time for purchase orders and travel vouchers.

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- Developed, published, and electronically made available to all REE employees and customers an REE Directory.
- Installation of 18 2-way video systems reducing travel and meeting expenses as well as facilitating collaborations among ARS scientists.

FISVIS Initiative

The Financial Information Systems and Visionary Strategy (FISVIS) is viewed as an important systems development enterprise. There is a tremendous need for a single financial information system. ARS will be a pilot agency to begin implementing the NFC's funds control system. The REE Information Engineering project will be coordinating its business area analysis of REE integrated financial management and financial planning, allocation, and execution. A senior position within the Financial Management Division is devoted to managing joint Departmental/REE initiatives of which a primary responsibility will be the development of a comprehensive plan regarding REE interaction with the Departmental/NFC FISVIS initiative.

USDA is responding to a changing financial environment and is working to integrate a large number of disparate financial information systems at the National Finance Center. Under the FISVIS initiative, the Department is replacing the current general ledger system with a new core financial system called the Foundation Financial Information System (FFIS). This system will help the USDA streamline financial system operations for all the agencies. The REE budget, finance, and accounting Business Area Analysis (BAA) documented the high level information requirements that will aid developers to implement FFIS in REE.

An REE implementation team is currently examining the FFIS system through hands-on experience with a demonstration system. It will then begin work to establish a small scale REE prototype on which to apply its requirements and experiment with FFIS capabilities. Subsequently, the team will plan data conversion, identify agency reporting requirements, determine agency user groups, define security needs, and study training needs.

Pilot testing of the system is scheduled to begin in October 1998.

E. FUTURE DIRECTION

AFM Strategic Plan

These are challenging and demanding times for AFM and its customers in the Research, Education, and Economic (REE) mission area. The pace of change, which has accelerated rapidly is expected to continue for the foreseeable future. Expectations for quality service

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will continue to grow despite tighter budgets, fewer FTE's, consolidations of functions, and continued regulatory constraints.

AFM's success depends on its ability to anticipate, understand, and respond to customer needs. It will also continually improve its services through the use of its quality partnership, business process reengineering, and streamlining initiatives. AFM services will be cost effective and add value for its customers.

The AFM strategic plan is the mechanism for building a partnership with the customers and a framework for future decision making, priority setting, and resource allocation. The strategic plan is a means of unifying various initiatives and planning efforts. Based on customer input and the agency's assessment of the future, AFM's constrained resources will be better focused on providing, or improving upon, critical core services while eliminating those services that are no longer needed. The strategic plan communicates clear action plans with performance targets and indicators by which customers and employees can measure AFM's overall performance.

Focus on one strategic outcome is to increase AFM's ability to effectively use technology and automation tools to help improve service capability, assist in the overall communications process, and ease some of the pressures of downsizing and tighter budgets. AFM will stay abreast of technology advances and seek improvements to the systems which cause the least amount of disruption in customer service.

ARS is also developing agency policy and procedures for a Capital Planning and Investment Control process as required by the Chief Information Officer, USDA. The ARS Information Technology Steering Committee is taking the lead in this initiative.

Information Technology Self-Assessment

A steering committee has been created and has developed plans for assessment of ARS information technology. It will address existing information, how it is being used, what the desired outcome is, and what needs to be done towards that goal. The self-assessment focuses on a set of "best practices" in the following six diagnostic areas:

- Importance of information management to the agency mission;
- Integration of strategic planning, budget, and evaluation;
- Measurement of the performance of mission goals;
- Focusing on process modernization in the context of an architecture;
- Manage projects as investments; and
- Build organization-wide information resources management capabilities to address mission needs.

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Telecommunications

Telecommunications will continue to be a major area of emphasis for ARS. It strives to maximize its communication and information transfer capabilities, and will seek to optimize the use of FTS 2000. Employees will have increased access to information and will be sharing data across the Agency and with other organizations. ARS expects to increase high speed access to databases in support of researchers and other specialists, as expansion of its use of local area networks and its ability to share information fully and timely is realized.

ARS Long-Range Objectives

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1. Objective 0-1: Germplasm Research Information Network

2. Status: Upgrade Completed

3. Objective Statement:

Improve and sustain quality support of the National germplasm research systems for plant, animal, microbial, insect, and aquaculture programs.

4. Strategy:

ARS will apply current computer technology to modernize the centralized computer database. ARS will develop a relational database to speed response and expand access for breeders and other users.

5. Program(s) Supported:

The development of a relational database for germplasm research supports ARS Program Plan Objective 2, Plant Productivity, and Objective 3, Animal Productivity.

6. Cross-cutting or Interagency Program Supported:

Not Applicable

7. Background:

The mission of the GRIN is to provide support to the national research programs whose missions are to acquire, maintain, evaluate, utilize, and make available to scientists a wide range of economically important plant, animal, microbial, insect, and forest trees germplasm. This germplasm provides the genetic diversity necessary to improve agricultural productivity to reduce genetic vulnerability in future food and agriculture development. The germplasm is maintained by networks of cooperating institutions, agencies, and research units in the federal, state, and private sectors with ARS providing the national leadership.

The GRIN database accumulates information about the preserved germplasm. It provides an automated retrieval capability for the collection and dissemination of germplasm information to scientists who are the users of the germplasm, and to managers and collection curators. Specifically, GRIN:

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Objective 0-1: Germplasm Research Information Network (GRIN) (Continued)

- Enhances communications with scientist regarding the location and characteristics of plant, animal, insect, microbial, and aquaculture germplasm;
- Permits flexibility to user in storing and retrieving information;
- Optimizes operational speed for all users; and
- Reduces redundancy and relates information about each germplasm accession.

The system operates on a Sun Computer System using a Unix operating system and Oracle RDBMS software.

8. Contact: Jimmie Mowder
Phone: 301-504-5318
Germplasm Research Information Network, Plant Sciences Institute, Beltsville, MD.

9. Major Milestones:

Activity	Planned Start Date (quarter)	End Date (quarter)	Actual End Date (quarter)
a. Upgrade hardware	1/97	9/97	9/97
b. Upgrade hardware/software	1/98	3/98	3/98
c. Upgrade hardware	1/99	3/99	3/99
d. Upgrade hardware/software	1/00	2/00	2/00
e. Upgrade hardware	1/01	9/01	9/01
f. Upgrade hardware/software	1/02	9/02	9/02

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Objective 0-1: Germplasm Research Information Network (GRIN) (Continued)

10. Resources:

thru Total	FY97	FY98	FY99	FY00	FY01	FY02	TOTAL
Costs (\$000)	4.675	825	740	785	785	800	8.610
Staff Years:	85.0	10.0	10.0	10.0	10.0	10.0	135

* NOTE: The FY 1997 figure is an accumulation of prior year costs for this objective.

11. Acquisition Description: Not Applicable

12. Departmental IRM Implementation Framework Area Supported:

Information and Data Management

ARS Long-Range IRM Plan FY 1998 - 2002

1. Objective 0-2: Global Change Data Assessment and Integration Project

2. Status: Continuing

3. Objective Statement:

The goal of this program is to develop a comprehensive model for the land-based biosphere component of the Earth as an integrated system comprising land, ocean, and atmosphere.

4. Strategy:

ARS is conducting a Department-wide global data survey, evaluating and implementing integrating mechanisms; promoting data exchange, preservation and retention; and supporting enhanced interagency and international data systems interoperability. ARS awarded a contract to study and develop the database structure.

5. Program(s) Supported:

This Objective supports ARS Base Program Area of Emphasis Objective 1 on Soil, Water, and Air, and Objective 6 on Integration of Systems. Objective 6, Integration of Systems, is divided into six sub-objectives. One of these, 6.1 - Resource Management: Systems and Models, includes development of "holistic models that predict the integrated effects of atmospheric chemical composition, climate, and management practices on productivity, water, energy, and trace gas balance of terrestrial ecosystems, ranging from field to global scales."

6. Cross-Cutting or Interagency Program Supported:

This supports the global change, environmental, and water quality Departmental crosscutting issues.

7. Background:

The goal of this program is to develop a comprehensive model for the land-based biosphere component of the Earth as an integrated system comprising land, ocean, and atmosphere. The model is as a means of understanding how both natural and human-induced processes will affect future environmental changes. As implied by its purpose, the development of the model will require complex integration of multitudinal types of data from many sources. The information will be the basis of designing response strategies that secure the continued productivity and health of human life-support systems.

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Objective 0-2: Global Change Data Assessment and Integration Project (Continued)

This project applies systems engineering and analysis to assess data holdings, preserving data at risk, and maximizing data integration and systems interoperability of global data across USDA agencies. The areas of work for the multi-year project are:

- Data survey, assessment, integration and access:
- Data rescue:
- Geographic information system (GIS) integration:
- Knowledge transfer; and
- Simulation model development and evaluation.

The U.S. Congress, in the Agriculture, Rural Development, FDA and Related Agencies 1992 Appropriations Bill-Conference Report (H.R. 102-239), directed the Department to contract with the Consortium for International Earth Science Information Network (CIESIN). ARS awarded a multi-year contract with CIESIN to perform a database assessment and assembled an integrated prototype database. Follow-on development involves expansion and refinement of the database.

8. Contact: Dr. Herman S. Mayeux
Phone: 301-504-5281
Natural Resources and Systems, National Programs Staff, Beltsville, MD.

9. Major Milestones:

Activity	Planned Start Date (quarter)	End Date (quarter)	Actual End Date (quarter)
a. Database assessment and structuring	4/92	2/93	2/93
b. Database prototyping	2/93	2/94	2/94
c. Database expansion	3/94	4/98	

ARS Long-Range IRM Plan FY 1998 - 2002

Objective 0-2: Global Change Data Assessment and Integration Project (Continued)

10. Resources:

thru Total	FY97	FY98	FY99	FY00	FY01	FY02	TOTAL
Costs (\$000)	*5159	**900	900	900	900	900	9.659
Staff Years:	75	0	0	0	0	0	75

* NOTE: The FY 1997 figure is an accumulation of prior year costs for this objective.

** Costs shown indicates system is in maintenance mode for FY98 - FY02.

11. Acquisition Description: Not Applicable

12. Departmental IRM Implementation Framework Area Supported:

Information and Data Management

ARS Long-Range IRM Plan FY 1998 - 2002

1. Objective 0-3: Telephones and Telecommunications Facilities

2. Status: Continuing.

3. Objective Statement:

ARS will modernize its telecommunication systems to effectively support the increasing voice, data, and image traffic requirements.

4. Strategy:

ARS has initiated a telecommunications modernization program to coincide with the increased requirements of its locations. GAO recommendations, USDA requirements and Year 2000 compliance.

ARS has prioritized the review of its existing telecommunications facilities. Where appropriate, ARS is upgrading voice and data communications equipment. Three full-time telecommunications specialists are coordinating the Agency's modernization program.

5. Program(s) Supported:

All ARS programs are supported by this objective.

6. Cross-Cutting or Interagency Program Supported:

All Interagency Programs supported by ARS are supported by this objective.

7. Background:

The ARS voice and data communications network is operating with changes in equipment technologies, network architectures, and service offerings. ARS is adjusting to new requirements and is realizing benefits from increased effectiveness and efficiency in communications. Many locations are operating obsolete private branch exchange and key telephone systems that do not support the operational and management needs of the Agency.

8. Contact: Steve Garvin
Phone: 301-344-2872
Administrative Information and Technology Division, Greenbelt, MD

ARS Long-Range IRM Plan FY 1998 - 2002

Objective 0-3: Telephones and Telecommunications Facilities - (Continued)

9. Major Milestones. Installed systems identified for reevaluation and replacement decisions (additional systems will be identified once the results of the Year 2000 Compliance Survey is completed):

Activity	Planned Start Date (quarter)	End Date (quarter)	Actual End Date (quarter)
a. Ft. Pierce, FL	4/97	4/98	
b. Miss. State, MS	4/97	TBD	
c. Gainesville, FL	4/97	4/98	
d. Miami, FL	4/97	3/98	
e. Ames, IA	1/98	3/99	
f. Wyndmoor, PA	2/98	3/99	
g. Plum Island, NY	4/98	3/99	
h. Lane, OK	1/98	4/98	
i. Lubbock, TX	1/98	4/99	
j. Weslaco, TX	2/96	4/99	
k. Beckley, WV	4/97	4/98	
l. Stuttgart, AR	2/98	1/99	
m. Parlier, CA	2/97	4/98	
n. Washington, DC	4/97	3/98	
o. Fort Lauderdale, FL	2/96	2/98	
p. Beltsville, MD	2/98	2/99	
q. El Reno, TX	2/97	4/98	
r. Stillwater, OK	4/98	3/99	

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s. Charleston, SC	4/97	3/98	
t. Bushland, TX	4/97	3/98	

10. Resources:

thru Total	FY97	FY98	FY99	FY00	FY01	FY02	TOTAL
Costs (\$000)	425	2,000	1,500	1,000	600	600	6,125
Staff Years:	2.0	2.0	2.0	2.0	2.0	2.0	12.0

* NOTE: The FY 1997 figure is an accumulation of prior year costs for this objective.

11. Acquisition Description: Telephone equipment acquisitions and/or upgrades:

(\$000)	FY97	FY98	FY99	FY00
\$ 0 - \$ 100	4	5	3	5
\$ 100 - \$ 200	1	2	2	3
\$ 200 - \$ 300	0	1	1	1
\$ 300 - \$ 600	0	1	1	1

12. Departmental IRM Implementation Framework Area Supported:

Delivery Systems
Agricultural Research Service

ARS Long-Range IRM Plan FY 1998 - 2002

1. Objective 0-4: Program, Administrative, and Financial Management Systems

2. Status: Continuing

3. Objective Statement:

Develop/enhance ARS Program and Administrative Management systems through FY 2001.

4. Strategy:

ARS plans to integrate systems for managing human, material, and facility resources into one structured, disciplined approach to attain program goals and objectives. This requires improving accountability, refining the system for allocating funds to national priorities, and refining a comprehensive annual resource management planning process.

5. Programs Supported:

This Objective supports all of the other Objectives in the ARS Long-Range Plan and contributes to the accomplishment of the Research Objectives in the ARS Strategic Plan. The automated program and administrative systems described in this objective provide an electronic environment that enables Agency employees to access, update, report, and share information in an efficient, effective manner. Research programs benefit from automated systems enabling them to access research, funding, human, material and facility information.

The effectiveness and success of these automated systems relies on telecommunications facilities for locating and accessing the appropriate information resource and transmitting that information between locations and within offices and laboratories at a location. This supports all other objectives that require the exchange of information outside of an isolated LAN environment. Objective 0-5, Information Engineering Methodology, ensures the integrated system approach represented by this objective is accomplished in a timely, efficient and effective manner.

6. Cross-Cutting or Interagency Programs Supported:

This Objective supports the USDA Modern Administrative Process (MAP) initiative. The automated systems described in this objective represent a process of integrating program and administration information that is utilized throughout the Agency and ultimately shared with other agencies. ARS will coordinate its applications development to be compatible with the Departmental MAP initiative.

ARS Long-Range IRM Plan FY 1998 - 2002

Objective 0-4: Program, Administrative, and Financial Management Systems (Continued)

7. Background:

Program, administrative and financial management systems have existed with focus on the ARS Area level. The national focus on planning, leadership and direction of ARS research, requires control and management from an Agency view of where we are now and where we want to go. This requires adjustment and development of systems which support this direction.

8. Contact: Keith W. Anderson
 Phone: 301-344-0291
 Administrative Information and Technology Division (AITD)
 Greenbelt, MD.

ARS Long-Range IRM Plan FY 1998 - 2002

Objective 0-4: Program , Administrative, and Financial Management Systems (Continued)

9. Major Milestones:

Activity	Planned Start Date (quarter)	End Date (quarter)	Actual End Date (quarter)
a. Budget and Program Management Construction tracking system	4/96	4/97	
b. Human Resource Activities			
1. Electronic Position Descriptions	1/96	3/97	3/97
2. Employee Relations Case Tracking	4/96	4/97	
3. PATS Conversion to Windows	2/98	2/98	
c. Information Technology Activities			
1. Wide Area Network:			
Data Gathering/Develop strategy	2/95	3/95	1/96
Procure WAN Backbone hardware	1/96	1/96	
Begin Phase 1 of WAN implementation	4/96	1/97	
2. REE Directory/Locator:			
Employee Directory RAD	2/96	3/96	3/96
Employee and Service Directory	3/96	6/97	
Employee and Service Directory System	1/97	9/97	

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Objective 0-4: Program , Administrative, and Financial Management Systems (Continued)

10. Resources:

thru Total	FY97	FY98	FY99	FY00	FY01	FY02	TOTAL
Costs (\$000)	4,152	491	261	263	265	250	5,682
Staff Years:	15	8	4.5	4.5	4.0	4.0	40

* NOTE: The FY 1997 figure is an accumulation of prior year costs for this objective.

11. Acquisition Description: Not Applicable

12. Departmental IRM Implementation Framework Area Supported:

Delivery Systems

ARS Long-Range IRM Plan FY 1998 - 2002

1. Objective 0-5: Automated Food Grouping System (FGS)

2. Status: Continuing

3. Objective Statement:

The work will automate grouping processes. These processes relate foods reported in USDA's food consumption surveys to recipes for those foods, separate each food into its ingredients, and regroup ingredients by selected characteristics for further analysis. An automated system will allow greater flexibility and efficiency in grouping foods reported in USDA's food consumption surveys and in reporting intake in terms of ingredients or commodities.

4. Strategy:

A Basic Agreement has been established with the General Services Administration for administrative and technical services in support of a contract to design as well as develop the operational system.

5. Program(s) Supported:

Distribution of Agency data for Federal and public use.

6. Cross-Cutting or Interagency Programs Supported:

Pesticide Data Program
Third Scientific Report on Nutrition Monitoring
EPA Dietary Risk Evaluation System
FDA Technical Evaluations for Food Safety Issues
USDA-DHHS Dietary Guidelines
Healthy People 2000

7. Background:

The objectives of an automated FGS are to

- a) build relationships between food data reported in the food consumption surveys, supporting recipe and descriptive (grouping) files, and the data required by specific projects;
- b) facilitate grouping of foods, ingredients, and/or commodities into categories identified by the researchers;

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Objective 0-5: Automated Food Grouping System (FGS) (Continued)

- c) facilitate the conversion of food data from the surveys or supporting data bases into comparable forms or units;
- d) reduce processing demands by selecting only the data required for building the project data set; and
- e) provide links between FGS produced files and survey demographic variables for subsequent summary and analyses by standard analysis procedures.

The system must support laboratory staffs with differing skill levels in food grouping and use of computer based systems. The FGS requires access to core data files, such as the Nationwide Food Survey, which are separately managed and controlled. The systems must be flexible, reliable, consistent, and sensitive to changes in data over time. It must enable the users to take advantage of other's efforts and develop project data sets within a reasonable period of time.

8. Contact: Annetta Cook
Phone: (301)734-5809
FAX: (301)734-5496

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Objective 0-5: Automated Food Grouping System (FGS) (Continued)

9. Major Milestones:

Activity	Planned Start Date (quarter)	End Date (quarter)	Actual End Date (quarter)
a. Planning (baseline analysis, requirements analysis, and Functional system design) Update the RMIS computer system to improve processing of NPS and BPMS	4/90	2/91	2/91
b. Develop Statement of Work (SOW) and Delivery Order Requirement (DOR)	2/91	2/92	2/92
c. Delegation of Procurement Authority (DPA) issued by USDA/OIRM	3/91	2/92	2/92
d. Technical Approval (TA) issued by USDA/OO	3/91	3/92	3/92
e. Issue procurement documents	3/92	3/92	3/92
f. Amend SOW and DOR and reissue	3/92	1/94	1/94
g. Issue DOR 1*	1/94	2/95	3/95
h. Issue DOR 2*	4/95	1/96	
i. Issue DOR 3*	4/95	2/97	
j. Additional DOR	2/97	4/98	

* NOTE: DOR's will be issued under existing GSA contract, therefore no milestone is listed for contract award.

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Objective 0-5: Automated Food Grouping System (FGS) (Continued)

10. Resources:

thru Total	FY97	FY98	FY99	FY00	FY01	FY02	TOTAL
Costs (\$000)	200	108	0	0	0	0	308
Staff Years:	1.5	1.5	0	0	0	0	3

11. USDA IRM Framework Area Supported:

Data management and customer support

ARS Long-Range IRM Plan FY 1998 - 2002

1. Objective 0-6: Survey Net

2. Status: Ongoing

3. Objective Statement:

To provide for automated coding of food intake data collected in the Continuing Survey of Food Intakes by Individuals (CSFII) and other individual food intake surveys.

4. Strategy:

To provide computer programs and database files to the Survey Contractor for coding food intake data and for recording information about new foods and portion amounts reported by survey respondents. To provide a mechanism for editing the coded food intake records and for efficient updating of database files used in the coding process.

5. Program(s) Supported:

Agency surveys

6. Cross-Cutting or Interagency Program Supported:

The survey food code files and supporting data are used by the Department of Health and Human Services (HHS) to support their surveys. CSFII data are used by FDA, EPA, and FTC for regulatory purposes.

7. Background:

The assignment of food codes and maintenance of food coding databases are among the most time consuming and labor intensive efforts involved in survey operations. Traditionally, they represent the greatest obstacle in producing food and nutrient consumption data on a basis timely enough to maximize the data's usefulness to public policy administrators and other users. Because the CSFII is a critical component of the National Nutrition Monitoring and Related Research Program (NNMRRP), prompt availability of data collected in that survey is paramount to the success of that program.

8. Contact: Betty Perloff
Phone: (301)734-5826

ARS Long-Range IRM Plan FY 1998 - 2002

Objective 0-6: Survey Net (Continued)

9. Major Milestones: None

10. Resources

thru Total	FY97	FY98	FY99	FY00	FY01	FY02	TOTAL
Costs (\$000)	**80	80	0	0	0	0	160
Staff Years:	1.1	1.1	0	0	0	0	2.2

** Costs shown indicates system is maintenance mode for FY97 - FY 98.

11. USDA IRM Framework Area Supported:

Data management and customer support

ARS Long-Range IRM Plan FY 1998 - 2002

1. Objective 0-7: Other Research Automation

2. Status: Continuing

3. Objective Statement:

Make modern computing and laboratory automation resources available to ARS scientists to foster successful achievement of research objectives.

4. Strategy:

ARS management encourages and supports scientists' needs for laboratory automation technology. ARS scientists are constantly seeking improvements to research processes through the use computer technology. The nature of their research being performed determines the type of computer resources needed at each location. Virtually every research project is supported by IRM technology.

The Administrator of ARS annually reviews each location's resources requirements with the National Program Staff and other advisors during the first month of the fiscal year. The need for computer resources is included in this review. The results of this review translate into an approved funding plan for the fiscal year. These decisions reflect the status of the research effort.

5. Program(s) Supported:

The ARS Research Program is based on six objectives in the Base Program Areas of Emphasis and three Special Programs.

ARS Base Program Areas of Emphasis:

- Objective 1. Soil, Water, and Air
- Objective 2. Plant Productivity
- Objective 3. Animal Productivity
- Objective 4. Commodity Conversion and Delivery
- Objective 5. Adequate Human Nutrition
- Objective 6. Integration of Systems

ARS Special Programs:

- 1. ARS Plant Genome Program/Animal Genome Program
- 2. ARS Global Environmental Change Research Program

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3. ARS Utilization Research Program

Objective 0-7: Other Research Automation (Continued)

6. Cross-Cutting or Interagency Program Supported:

ARS supports these Crosscutting Programs:

1. Food Safety
2. Improved Human Nutrition and Health
3. Water Quality Protection
4. Environmentally Compatible Pest Control

7. Background:

ARS has 103 locations where research is conducted in many fields of agricultural science. New scientific instruments with microcomputers enable scientists to gather and process data with greater precision, control, and efficiency. In many cases, new equipment is necessary in response to a new mission or program redirection. ARS uses highly developed commercial software to conduct research.

In other cases, the need for computer resources for additional capacity or capability changes as the research program evolves. Often, the successful use of automation technology early in a project leads to the need for additional computer resources to fully develop the research.

One major software used by laboratories is the SAS software licensed from SAS Institute, Inc. ARS uses SAS products for research, statistical, and mathematical applications for market programs, laboratory activities, standardization functions, analysis, and many related Agency activities.

8. Contact Pamela Mason
 Office of Deputy Administrator, NPS, Beltsville, Maryland
 Phone: 301-504-5861

9. Acquisition Description: Not Applicable

10. Major Milestones: None

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Objective 0-7: Other Research Automation (Continued)

11. Resources:

Category (\$000)	FY97	FY98	FY99	FY00	FY01	FY02	TOTAL
Purchase of hardware & software supplies	13,200	13,350	13,275	13,360	13,535	13,710	80,430
Commercial services/ operations	3,480	3,700	4,070	4,170	4,270	4,372	24,062
SAS License	250	262	275	290	304	316	1,697
FTS 2000	3,184	3,120	3,058	2,997	2,936	2,875	18,170
Personnel	5,000	5,000	5,500	5,500	5,500	5,500	32,000
NAL/ Plant Gnome	1,450	1,450	1,450	1,450	1,450	1,450	8,700
Total Costs	26,564	26,882	27,628	27,767	27,995	28,223	\$165,059
Staff Years:	140	140	140	140	140	140	840

12. USDA IRM Implementation Framework Area Supported:

Business/Customer Support
Information and Data Management

ARS Long-Range IRM Plan FY 1998 - 2002

1. Objective 0-8: Radio System

2. Status: New

3. Objective Statement:

REE will modernize its radio systems to effectively support the radio traffic requirements and to comply with congressional and national radio usage policy.

4. Strategy:

AFM has initiated a radio system modernization program to coincide with congressional mandated changes to radio spectrum policy. AFM/AITD will gather data and analyze the various types of radios used throughout REE. Based on the number of existing radios, a projected cost will be derived. Once this is accomplished all area/location offices will be prioritized for system upgrades over the next eight years.

5. Program(s) Supported: All ARS programs are supported by this objective.

6. Cross-Cutting or Interagency Program Supported:

All Interagency Programs supported by ARS are supported by this objective.

7. Background:

Radio spectrum usage is operating with changes in policy and equipment technologies. Due to these changes it has been mandated by Congress that Federal Government utilize the radio spectrum more efficiently. To comply with the mandate, all frequency modulated land mobile radios, must be replaced and comply with the new policy by FY 2005.

8. Contact: Steve Garvin

Phone: 301-344-2872

Administrative Information and Technology Division, Greenbelt, MD

9. Major Milestones.

A major data gathering project will take place during fourth quarter 1997 and will be completed by the end of first quarter 1998. Once the data gathering is completed, ARS will have a better understanding of what radio equipment resources are required and what the financial impact will be over the next 10 years.

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Objective 0-8: Radio System (Continued)

10. Resources:

The initial data gathering will be accomplished with input from the Area Property Officers and Location Administrative Officers. The data analysis will be undertaken by the Agency frequency manager.

11. Acquisition Description:

Radio equipment acquisitions and/or upgrades will be specified once estimated costs are projected from the data analysis stage of this objective.

ARS Long-Range IRM Plan FY 1998 - 2002

1. Objective 0-9: Implementation of a Relational Database and Graphical User Interface Development Software.

2. Status. New.

3. Objective Statement.

ARS will implement a new relational database and Graphical User Interface (GUI) development platform capable of handling enterprise-wide systems across a Wide Area Network.

4. Strategy.

ARS researched, evaluated, and benchmarked various relational databases and GUI development products to determine which platform would best meet ARS' needs for enterprise-wide applications now and into the future.

Once the analysis of the various products is completed, a recommendation will be made for the purchase of the necessary hardware, software, and training. An implementation plan will be developed to gradually move the whole agency to the new platform taking into consideration the needs in the various ARS area offices.

5. Program(s) Supported.

The relational database and GUI development software will be used for administrative systems developed to support the administrative needs of the Research, Education, and Economics agencies.

6. Cross-Cutting or Interagency Program Supported:

This new database and development software will support the administrative information needs of the Research, Education, and Economics agencies and interface, where appropriate, with Departmental systems.

ARS Long-Range IRM Plan FY 1998 - 2002

Objective 0-9: Implementation of a Relational Database and Graphical User Interface Development Software. (Continued)

7. Background.

ARS currently uses PROGRESS as the relational database with a mixture of development tools which includes, but is not restricted to Microsoft Access and Visual Basic. We also continue to support systems developed for the dBase database structure and written in dBase and Clipper. Recognizing our need to support larger databases and applications with more users over a Wide Area Network, we began an analysis to determine the best development platform for our future systems. This analysis lead us the realization that PROGRESS should not be the relational database for our future because of inherent limitations.

8. Contact: Janet Nolton
Phone: 202-720-4789
Administrative Information and Technology Division, Washington, D.C.

ARS Long-Range IRM Plan FY 1998 - 2002

Objective 0-9: Implementation of a Relational Database and Graphical User Interface Development Software. (Continued)

9. Major Milestones.

Activity	Planned Start Date (Quarter)	End Date (Quarter)	Actual End Date (Quarter)
Identify requirements for GUI development software and relational database	3/95	4/95	4/95
Research & evaluate products	4/95	1/96	1/96
Benchmark final products	2/96	2/96	3/96
Recommend acquisitions necessary for GUI development software and relational database	2/96	2/96	3/96
Develop requirements for WAN & LAN implementation	2/96	4/96	7/96
Install relational database & GUI development software at headquarters	3/96	4/96	10/96
Develop implementation plan for installation of relational database in areas	3/98	6/98	
Implement first administrative system, REE Locator, on with new relational database and GUI development software	2/98	3/98	

ARS Long-Range IRM Plan FY 1998 - 2002

Objective 0-9: Implementation of a Relational Database and Graphical User Interface
Development Software. (Continued)

10. Resources.

thru Total	FY97	FY98	FY99	FY00	FY01	FY02	Total
Costs(\$000)	100	25	25	25	14	14	203
Staff Years	2.0	2.0	1.0	1.0	1.0	1.0	8.0

11. Acquisition Description.

For this objective, ARS will be acquiring software for a new relational database to support 100 concurrent users, technical support and upgrades for the relational database, training for a database administrator, GUI development software for the development staff, training for the development staff, and technical support and upgrades for the development software. In the out years, ARS will be acquiring continuing technical support and upgrades for the relational database and the GUI development software. Additionally, as our database usage expands we may add more concurrent users.

12. Departmental IRM Implementation Framework Area Supported:

Agricultural Research Service
Research, Education, and Economics agencies

ARS Long-Range IRM Plan FY 1998 - 2002

1. Objective 0-10: ARS Wide Area Network

2. Status:

The ARS backbone network is in place and is currently in the process of optimization of services. This backbone network links AFM Greenbelt, ARS Administrator, DC, the eight area offices, NPS, and NAL and utilizes FTS data services consisting of DTS T-1s, packet switched and enhanced packet switched services.

3. Objective Statement:

ARS will continue to optimize the existing agency WAN backbone network and services and implement new WAN services to the agency locations. This will facilitate the ability to share agency and Departmental resources throughout ARS. Further, this will improve communication for both the program and administrative functions of the agency.

4. Strategy:

ARS has researched the need to exchange data throughout the agency. This research was done via user/client interviews, categorizing existing implementations of data exchange, assessing key agency and Departmental systems (implemented and planned), and analyzing other REE and USDA agencies' data exchange needs and/or solutions.

Based on the findings of the above procedures, an agency-wide WAN will be designed, implemented, and maintained. This will be done in phases. Phase I is the design and implementation of the backbone network. Phase II is the design and implementation of the large agency centers and key locations as well as locations that have immediate needs. Phase III is the design and implementation of all other agency locations. Phase IV is connecting the ARS WAN to the other REE and USDA networks. Optimization and modification will occur throughout all phases as services and needs require.

5. Program(s) Supported:

This supports all other objectives that require the exchange of information outside of an isolated LAN environment.

6. Cross-Cutting or Interagency Program Supported:

All Interagency Programs supported by ARS are supported by this objective.

ARS Long-Range IRM Plan FY 1998 - 2002

Objective 0-10: ARS Wide Area Network (Continued)

7. Background:

Based on the AFM Strategic Plan and interview with key agency customers, a need has been established to better share data and resources electronically both internally and externally.

ARS has developed a plan to design and implement an agency wide network that will facilitate these data sharing requirements (current and future)

This new network replaces an older and slower network that no longer supports the growing data sharing needs of the agency.

8. Contact: Tom Howell
Phone: 301-344-0291
Administrative Information and Technology Division, Greenbelt, MD

ARS Long-Range IRM Plan FY 1998 - 2002

Objective 0-10: ARS Wide Area Network (Continued)

9. Major Milestones:

Activity	Planned Start Date (quarter)	End Date (quarter)	Actual End Date (quarter)
a. Data Gathering/Develop strategy	3/95	4/95	9/96
b. Procure WAN Backbone hardware	4/95	9/95	11/95
c. Procure WAN Backbone FTS services	6/96	9/96	11/96
d. Implement WAN backbone hardware services	8/96	9/96	3/97
e. Design WAN Phase II connectivity	6/97	9/97	
f. Procure WAN Phase II hardware	6/97	9/97	
g. Procure WAN Phase II FTS services	6/97	9/97	
h. Implement WAN Phase II hardware and services	10/97	12/97	
i. Design WAN Phase III connectivity	4/98	4/99	
j. Procure WAN Phase III hardware	4/98	9/99	
k. Procure WAN Phase III FTS services	6/98	11/99	
l. Implement WAN Phase III hardware and services	9/99	9/00	
m. Design and implement WAN Phase IV connectivity	TBD	TBD	

ARS Long-Range IRM Plan FY 1998 - 2002

Objective 0-10 ARS Wide Area Network (Continued)

10. Resources

thru Total	FY97	FY98	FY99	FY00	FY01	FY02	TOTAL
Costs (\$000)	75,000	TBD	TBD	TBD	TBD	TBD	75,000
Staff Years:	5	TBD	TBD	TBD	TBD	TBD	5

11. Acquisition Description:

The agency will procure communications hardware (routers, cabling, gateways, etc) in FY 97 - 99 for Phases II and III. Also, FTS data communication services will be procured for each phase and will be specified once requirements and designs are finalized for each phase.

CHAPTER II

National Agricultural Library (NAL)

National Agricultural Library
Agricultural Research Service
IRM Long-Range Plan
FY 1998 - FY 2002

A. NATIONAL AGRICULTURAL LIBRARY AND IRM PLAN OVERVIEW

1. Introduction:

a. Organization Overview:

The National Agricultural Library (NAL) serves as the nation's chief agricultural information resource. It provides agricultural information, products and services to Agencies of the USDA and to public and private organizations, and individuals. NAL coordinates a national network of public and private agricultural libraries and information centers, especially with libraries of the land grant colleges and universities, and other State supported colleges and universities with agriculturally related programs, other public organizations, and industry and other private sector organizations.

NAL ensures the acquisition, organization (including cataloging and indexing), management, preservation, accessibility, and diffusion of information in all phases of the agricultural and allied sciences, as set forth in Title XIV of the Food and Agriculture Acts of 1977 and 1981. A significant part of this mission is the development and coordination of a national agricultural science information network. The Library provides leadership for the management of agricultural information resources through products and services, including bibliographies, loans, photocopies, microforms, structured agricultural thesauri, computerized database repositories, indexing of agricultural information, and personal reference services including online computerized literature searches.

NAL works closely with other Agencies in the Department, coordinates activities with the other three national libraries: the National Library of Medicine (NLM); the Library of Congress (LC); and the National Library of Education (NLE). NAL also cooperates with other groups in both the public and private sectors, to ensure that the results of research and other types of agricultural information are rapidly disseminated to the ultimate user. NAL promotes the use of modern technology in support of library and information activities.

NAL provides a leadership role in U.S. participation in international agricultural library and information systems and in efforts to promote worldwide availability of agricultural information. In addition, the NAL serves as the Nation's major source of agricultural information received from and relayed to other countries, as the agricultural information liaison to international organizations and organizations outside of the United States, and as the U.S. agricultural representative in the setting of library and information standards internationally.

The Library was instrumental in forming, and works closely with the United States Agricultural Information Network (USAIN), an organization developed to provide a national forum through which agricultural librarians and information specialists might address the many issues associated with the collection, access, preservation, and delivery of agricultural information in the 1990's.

The National Agricultural Library is located in Beltsville, Maryland, with a Reference Center in downtown Washington. The Library has no official field offices but maintains close relationships with all USDA Agency libraries and the land grant library community. NAL is staffed by about 230 professionals, non-professionals, and clerical. In the broadest sense, all of these people are related to IRM since the mission of the Library is the collection, control, and dissemination of information.

The attached organizational chart for the National Agricultural Library shows the Agency structure. The Office of the Director is responsible for providing leadership and direction in accomplishing NAL's mission. The Technical Services Division is responsible for the acquisition, organization, and preparation of library materials. The Public Services Division is responsible for reference service, information center operation, document delivery, and collection maintenance. The Information Systems Division is responsible for the organization and delivery of technical information through library automated systems, and for developing new technology applications for the Library.

b. NAL's IRM Program

Technical program-related IRM support at the NAL is provided by the Information Systems Division, which has broad responsibility for all automation activities at NAL. The information Systems Division consists of a staff of approximately 30 people organized into three functional units: the Office of the Associate Director for Automation, the Library Automation Branch, and the Database Administration Branch. The mission and goals of the Division are as follows:

MISSION

To develop and provide automated services, programs and products that facilitate access to and utilization of information; and to provide technical leadership in utilizing new technologies for information delivery.

GOALS

1. To provide timely and effective service in the maintenance of production databases.
2. To provide timely and effective Current Awareness Literature Service.
3. To provide automation support for all NAL units.
4. To facilitate the development and use of new technologies for information delivery.
5. To administer and manage the above activities in an efficient and effective manner.

2. IRM Planning Process

The IRM planning process at the National Agricultural Library is a continuing process. Being responsive to executive and legislative initiatives is a key focus in such planning. The annual call for the Agency IRM Long Range Plan gives an opportunity to coordinate and consolidate the on-going planning activities.

The Agency IRM planning process includes linkages to Agency budget and program planning. Information collected during the planning process is used for both the IRM Long Range Plan and the Agency budget submittal, thus ensuring that these documents are consistent and reflect the most current Agency planning activities.

IRM initiatives and resource requests within NAL are reviewed and approved by the senior management team. New initiatives and major enhancements to ongoing programs are reviewed and evaluated against Departmental goals and executive and legislative programs.

Final decisions are made based on effectiveness of proposals in meeting needs in high-priority program areas.

NAL emphasizes interagency programs, which includes coordination and initiation of joint programs with agencies under the supervision of the Under Secretary of Agriculture for Research, Education, and Economics as well agencies under the supervision of the other Under Secretaries.

3. Current IRM Environment

NAL has automated management of all library functions from acquisition to document delivery through its ISIS (Integrated System for Information Services), a turnkey integrated library system. ISIS also enables NAL to produce, maintain and enhance the NAL-produced AGRICOLA (*A*griculture *O*nline *A*ccess) bibliographic database of more than three million citations to the scientific literature of agriculture that is presently available through a commercial vendor and NTIS. Access to the NAL Online Public Access Catalog (OPAC) bibliographic database component of ISIS, which contains all of the AGRICOLA cataloging records and all AGRICOLA Indexing records since 1989, is now provided through the NAL World Wide Web site via the Internet Telnet protocol. ISIS began its current system life-cycle in 1992 and is scheduled to be evaluated in FY 1998 to determine what future directions are required to capitalize on technology advances and meet customer requirements.

NAL completed installation of its hard-wire infrastructure in 1995, which now provides the NAL staff Ethernet 10-Megabyte high-speed internal communications, and full connectivity access to the Internet via a T-1 line connection. This meets current requirements for document transmission and both internal and external communication. Growth in use of multimedia resources would require migration to a greater band width for transmissions to and from external sources. Internet-connected servers and corresponding clients have been established to support access to and dissemination of information resources.

NAL continues a number of projects utilizing optical technologies for information storage and dissemination. Optical scanning, optical character recognition, and optical storage are being used to capture, store, and disseminate textual agricultural material to the land grant community. Graphic materials such as photographs, prints, posters, and film strips are also being stored on optical media for more effective storage and dissemination.

Other technology applications include hypertext and expert systems to enhance access to aquaculture information and training for the application of pesticides. Optical scanning and text recognition is now part of the indexing operation and enables staff to include abstracts in the AGRICOLA database at four times the previous rate. Automated training of catalogers is a distinct possibility for the future with a cataloging training prototype developed at NAL.

NAL is collaborating with the land-grant university community and REE agencies in the operation of AgNIC (Agriculture Network Information Center). AgNIC has continued to expand and enhance the unique and value-added services it provides through its Internet World Wide Web site, which is growing in recognition as a focal point on the Internet for quality

agriculture-related resources and as an example of the type of emerging services envisioned under the National Information Infrastructure (NII) initiative. NAL is continuing collaboration with Iowa State University, the University of Arizona, the University of Nebraska, and Mann Library at Cornell University to provide online library reference assistance services as a key component of the AgNIC distributed network. This well-received prototype service which facilitates the sharing of resources is being continued beyond its pilot project phase.

NAL current IRM planning has included examination of computing environment issues related to the potential impact exposure of the Year 2000 phenomenon could have on the hardware, software, people, data, and procedures that are the key components of our computing systems. Current plans for migration of systems to a "Year 2000 Compliant" environment will preclude any disruption of operations or diminution of current information services. NAL does not have any "in-house" applications that are affected and all affected applications and operating systems are scheduled for correction by contractors. The contractor that developed and supports our turnkey integrated system for library operations has advised that a soon-to-be released upgrade of their application software will include provisions that address the Year 2000 year-date problem. Likewise, the vendor for the operating system software has advised that they will make required system modifications to preclude problems with their software.

4. Accomplishments

Production operations of ISIS (Integrated System for Information Services), have been significantly enhanced. NAL now produces and issues the sale tapes for its AGRICOLA database through ISIS, which will result in significant cost savings. The Acquisitions and Serials Branch now has the capability to order monographs electronically from commercial book vendors. Microcomputer workstations support online searching of a variety of database services as well as local searching of CD-ROM databases by both NAL reference staff and NAL patrons. Access to NAL's online bibliographic database of resources in the NAL collection is now provided via the Internet and through the NAL World Wide Web site.

NAL IRM initiatives have contributed significantly to the success achieved in applying current and emerging technology to enhance library operations as well as to achieve the USDA objective to increase information sharing throughout the agricultural community. In addition to the technological enhancements previously outlined with respect to NAL's current IRM environment, the benefits of NAL IRM initiatives can be seen as initiatives transition to operational status.

An NAL initiative using optical scanning technology to enter bibliographic data and author extracts into the AGRICOLA database is now operational. In addition to improving accuracy of data input, optical scanning enhanced efficiency by eliminating manual data entry of abstracts.

A second initiative which is now an operational system is the National Agricultural Text Digitizing Project (NATDP). The NATDP was a cooperative effort between the NAL and 42 land-grant university libraries to test a method of capturing full-text and images in digital format for publication on CD-ROM discs. This program will contribute toward USDA objectives to maximize opportunities to share information and toward providing a technological environment to support program delivery.

NAL use of an *Ariel* document delivery system facilitates the electronic delivery of documents to Ariel Sites throughout the United States, Canada, Australia, Hong Kong, the United Kingdom, and several Scandinavian countries. Additional benefits have been achieved as the use of the system has been expanded to support USDA Field Libraries and other USDA sites.

Through the AgNIC (Agriculture Network Information Center) World Wide Web site, NAL and its land-grant university partners are providing unique value-added agriculture information resources worldwide and have made in the successful transition of AgNIC from a prototype project into a valuable and viable resource on the Internet. As a result, use of AgNIC increased eightfold with just sixteen months after it was established on the Internet. AgNIC now serves as a gateway with linkage to more than 700 agriculture-related databases, datasets, and information systems and has established a reputation for identifying high-quality resources and its superb record descriptions of these resources. Lessons learned from this effort include verification that there is a demand for quality resources that are easily discerned from among the proliferation of sites that only provide superficial resources.

Other unique resources that set AgNIC apart from other information providers include a comprehensive calendar of national and international conferences of agricultural events with emphasis on those of scientific significance; linkage to more than 40 other meeting calendars in databases created by NAL in collaboration with research scientists; a directory of nearly 100 subject-focused directories of agriculture-related information resources on the Internet categorized by 16 different subject area; and a directory of more than thirty separate directories of subject area experts.

NAL was engaged in a number of other cooperative projects, such as the Plant Genome Project, which involve the creation of information databases which are greatly benefiting researchers as well as the entire agricultural community. The USDA National Genetics Resources Program is a cooperative effort of the Agricultural Research Service (ARS), the Cooperative State Research, Education, and Extension Service (CSREES), and NAL to incorporate germplasm conservation and five genome research programs (plant, tree, animal, insect and microorganisms). NAL has management responsibility for the data and information component of the program gathered from the genome research programs and the international community at large and stored in a master database. Cooperators inside and outside of USDA have been engaged in the database design efforts and are coordinating the capture and evaluation of genetic information. The major target user groups are plant breeders and molecular geneticists.

The Agricultural Genome Information Server (AGIS) has evolved from the design and development stage to full production being accessed more than 200,000 times a month from users in 70 countries. The database now consists of 10 Gigabytes of genome data which has been uploaded from about 20 collaborative genome databases and 15 ancillary databases that range from bibliographic reference databases to plant chemicals and germplasm. and relevant bibliographic data from AGRICOLA. It contains a wide variety of genomic data including information about maps (genetic, physical, etc.), sites (mappable objects such as genes), variations of sites (e.g., mutations and alleles), phenotypic traits, probes, gene products, and germplasm. The database is now being expanded to include data from solanaceous crop plants, rice, cotton and ultimately all of approximately 70 important crop commodities.

Interactive access to AGIS is provided via the Internet and modem dial-up service. The data and information are presently made available on NAL's Agricultural Genome Gopher Server and NAL's Agricultural Genome World Wide Web Server. The data can also be accessed via automated responses to electronic mail queries. The database provides links to other relevant databases such as DNA and protein sequence databases, and ARS's GRIN (Germplasm Resources Information Network). Two CD-ROM's of the database have been released and more are planned.

5. Future Direction

In the next few years, NAL expects to continue to expand its use of technology in pursuit of its mandated responsibilities as a National Library and the USDA Departmental Library and to improve the control, access, and dissemination of agricultural information to the national and international agricultural communities.

Enhancements to the ISIS integrated library system will include full implementation of the 3 million record AGRICOLA database. Enhanced telecommunications facilities will provide the capability to deliver this information to agencies and institutions worldwide. This will be a new advance in resource sharing. Advances in optical storage capacity and optical character recognition will make it feasible to supply not just bibliographic information but content as well in machine form to both local and remote users. The miniaturization of the NAL collections will provide better access to materials, reduce the space required for storage, and facilitate efforts to preserve selected collections.

NAL completed Phase II of a major three-phase planning effort which focused on the issues related to electronic information management and the policies and procedures required to improve its capability to meet the legislated mandate to enhance access to agricultural information. The thrust of the initiative is to implement a program aimed at achieving an effective transition from information services using a traditional, print collection to providing electronic access to information via the Internet as part of the National Information Initiative (NII). The EII will create the infrastructure required to ensure that NAL will have the

capacity to function in this newly created environment, in which the instantaneous transmission of information worldwide is fast evolving as the standard.

The access and distribution portion of the EII involved establishing the prototype Agricultural Network Information Center (AgNIC) mentioned in paragraphs 3 and 4, above. As previously indicated, the pilot project involved collaboration with selected land grant universities, and USDA agencies in the Research, Education, and Economics community. AgNIC will continue as subject-based distributed network information center on the Internet to enhance electronic access to agriculture-related information, people and other resources. During FY 1998 and 1999, efforts to expand and enhance AgNIC will include adding new partners to collaborate in developing AgNIC information resources, and in developing and implementing a marketing plan to increase awareness of the quality resources that are available through AgNIC.

NAL, in partnership with the Department's Chief Information Officer, key representatives of the USDA mission areas, and other stakeholders, is submitting a new initiative to effectively manage and preserve all of the Department's important digital information products and to make them broadly available to the American public. This new initiative is included as part of the NAL IRM Long Range Plan for FY 1998-2002 as Objective Number 6.

NAL staff members chair or serve as active members in USDA intra-agency, inter-agency, national and international standards committees within and outside the library community to develop and influence the evolution of standards. NAL uses the United States Machine Readable Cataloging (USMARC) national standard for bibliographic formats to catalog records in the NAL bibliographic database and is participating in an international effort to develop a Unified Agricultural Thesaurus (UAT) with international standards for agricultural terminology. Other standards committees in which NAL participates are dealing with issues on the management, storage, retrieval and transmission of electronic information, images, and related source data.

B. NATIONAL AGRICULTURAL LIBRARY (NAL) IRM OBJECTIVES

1. Objective Title: Integrated System for Information Services (ISIS), Objective Number 1.
2. Status: Continuing (C).
3. Objective Statement: To automate all principal library functions at the NAL and develop system enhancements to support networking with land grant libraries and other institutions.
4. Strategy: Maintain and enhance effectiveness of an integrated automated library system that automates NAL's library operations to include acquisitions, cataloging and indexing data entry, circulation and serials control, online catalog of holdings, bibliographic database production, and document delivery.
5. Program(s) Supported: This initiative will enhance the efficiency and effectiveness of library operations, improve access to essential agricultural information by researchers and other users within and outside the USDA, and expand the NAL capability to share information throughout the world in a timely and responsive manner.
6. Cross-Cutting or Interagency Program Supported: This initiative directly supports USDA IRM objectives to integrate IRM and program planning, maximize information sharing, and use technology to support program delivery.
7. Background: NAL's ISIS system is a turnkey minicomputer system that, with contractor assistance, integrates all library functions into one online system and improves the productivity of NAL staff members. The present system began a new system life cycle in 1992 with the acquisition of a HP minicomputer to provide the required computer capacity for the system.
8. Contact Name, organization, and Phone Number:
 - a. John Stetka
 - b. National Agricultural Library, Information Systems Division
 - c. Phone: (301) 504-6813

9. Major Milestones

	<u>Planned Start Date</u>	<u>Planned End Date</u>	<u>Actual End Date</u>
a. Implement Indexing	05/92	12/93	10/93
b. Implement AGRICOLA tape processing	05/92	12/93	10/93
c. Implement title authority	03/93	12/93	06/93

d. Implement Circulation	12/93	12/94	01/95
e. Implement Electronic ordering	12/93	12/94	01/94
f. USDA Internet access to ISIS	06/94	06/95	02/96
g. Evaluate effectiveness of ISIS system	09/97	03/98	
h. Analyze alternatives for future services	03/98	09/98	
i. Implement Document Delivery Component	02/98	02/99	
j. Implement Statistics Collection & Reporting	11/97	11/98	
k. Migrate acquisitions from Novell to Windows NT	03/96	12/96	

10. Resources:

<u>Fiscal Years</u>	<u>Thru</u> <u>FY97</u>	<u>FY98</u>	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY 03+</u>	<u>Total</u>
a. Total Costs (\$000)	2635	600	1155	495	425	430	430	6170
b. Staff Years	3.5	3.5	3.5	3	3.5	3.5	3.5	23.5

11. Acquisition Description: Acquisition of new upgraded minicomputer with capability to support the processing requirements of the system.

12. Departmental IRM Implementation Framework Area Supported: Information and data management.

1. Objective Title: Electronic Information Initiative (EII), Objective Number 2.

2. Status: Continuing (C).

3. Objective Statement: To begin to create the infrastructure necessary to establish NAL as the central node in an electronic system, providing agricultural information by directly linking users with the information producers. To use advanced technologies to store, preserve, retrieve, and disseminate full text, bibliographic and image information. To develop an information network using improved information delivery systems to serve the agricultural community.

4. Strategy: Installing and maintaining an appropriate hardware/software platform to allow NAL staff to take maximum possible advantage of the NAL Internet connection is one area of concentration in the network-based agricultural information program NAL is developing. The NAL is now fully wired for network connectivity and Internet-connected servers and corresponding clients have been established to support the dissemination of electronic agricultural information. A computer system within NAL will be developed to provide access to AGRICOLA, plant genome databases, other research and bibliographic databases as well as electronic texts and journal archives. Multiple use graphical workstations will be purchased to access and process data in a wide variety of electronic formats. Critical agricultural electronic information resources will be identified; many of those rated highest will be purchased or licensed. Increased technical competence and awareness of NAL staff with respect to use of network resources is another key component. Full text databases are supported by online or optical information storage and retrieval systems which contain the full text (entire textual content) written information. Once the information is stored in its entirety, it can be indexed and analyzed at a much more detailed level; and it can be accessed (i.e., "delivered") over the phone lines via remote terminals, or through local microcomputer systems. This has extensive and significant implications for the cost, effectiveness, speed, reliability, and user satisfaction of current document acquisition, analysis and delivery systems.

Multi-faceted approaches will be used to evaluate ways to add value to existing information, to include the use of the Standard Generalized Mark-up Language (SGML) for identification of machine readable documents and hyper text links to interconnect complex concepts. Locating techniques include concept searching, neural-net searching and intelligent query search agents.

Another key component in the Initiative is the creation of an Internet-based Agricultural Network Information Center (AgNIC). The AgNIC will provide a wide range of agricultural information in a variety of digital forms, such as databases, computer programs, data files, electronic journals, etc., to both the NAL staff and the broader agricultural community.

The final element will extend networking knowledge and expertise to other organizations with which NAL cooperates, so that they may also take full advantage of the AgNIC and other network resources.

5. Program(s) supported: This Initiative supports NAL programs related to its mission to organize, store, and improve access to agricultural information and to coordinate with private industry and agricultural college and universities and others to develop a comprehensive agricultural network. This Initiative will significantly enhance access to agricultural information for NAL staff, other USDA agencies, the Land Grant University system by providing and facilitating access to digital library materials and by providing the technological tools that underpin the ability to work successfully in a digital environment.

6. Cross-Cutting or Interagency Program Supported: This initiative supports USDA IRM objectives to maximize information sharing, to integrate IRM and program planning and to use technology to support program delivery.

7. Background: The National Agricultural Library has the primary responsibility within USDA for acquisition, organization, and delivery of agricultural information. Historically, this information has been acquired and delivered in its printed or published form. Since 1862, NAL has been making printed information available for loan or on-site use; and more recently, NAL has offered "photocopy-in-lieu of loan" for printed material. Each year over 250,000 requests are received for items in the NAL collection, or those of its Regional Document Delivery System. As an organization with responsibility for delivering such large quantities of information, NAL is interested in, and responsible for, the development of alternative document acquisition and delivery systems. Toward this end, NAL has been studying the development of electronic "full text" databases, document acquisition and delivery mechanisms and programs to improve end-user access to information through value-added processing and improved access mechanisms.

The emergence of the Internet and its related computer networks as a preeminent vehicle for the sharing of scholarly information provides a great challenge for libraries. In their traditional role of information providers, libraries have relied mainly on systems designed around paper as the primary medium for the delivery of information. The emergence of computer networks and the appearance of digital information in its many forms demand that libraries modify existing systems and build new ones that will meet the exigencies of the digital age. As one of the three U.S. National Libraries, NAL must take the lead in the planning, design, and creation of such systems. As the preeminent U.S. agricultural library, NAL must have the ability to efficiently perform its identification, collection, dissemination, and archiving responsibilities when dealing with materials in a wide variety of electronic formats. This initiative supports these goals.

8. Contact Name and Phone number:

- a. Gary McCone
- b. National Agricultural Library
- c. Information Systems Division
- 4. (301) 504-5018

9. Major Milestones:

	<u>Planned Start Date</u>	<u>Planned End Date</u>	<u>Actual End Date</u>
a. Complete wiring of NAL Building for TCP/IP network	10/94	12/94	
b. Establish network database access	10/94	Ongoing	

c. Establish network connectivity redundancy	12/94	6/95	
d. Establish NAL World Wide Web site	10/94	6/95	4/95
e. Networked AGRICOLA for NAL staff (WINSPIRS)	12/94	9/96	3/96
f. Produce NAL publications in electronic form	1/95	12/97	
g. Evaluate use of SGML to effectively access electronic documents	11/94	12/96	
h. NIDR Services from the desktop	11/94	6/95	4/95
i. Electronic Media Center Established	10/94	9/96	1/97
j. Creation of AgNIC	05/95	9/98	

10. Resources:

	Thru							
	<u>FY97</u>	<u>FY98</u>	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03+</u>	<u>Total</u>
a. Total Costs (\$000)	962	1000	1000	1000	1000	1500	1500	7962
b. Staff Years	1	2	3	5	5	5	5	26

11. Acquisition Description: Telecommunications, applications software, and multimedia workstations. This initiative includes multiple short-term and other evaluations of technology not involving computer systems. The initiatives do not involve a specific system and do not have a system life cycle.

Equipment and services to be acquired under this initiative will include Internet access service, networking hardware and firmware, UNIX workstations, and database software. Contracting costs are not expected to exceed \$5 million during fiscal years 1999-2003.

12. Departmental IRM Implementation Framework Area Supported: Information and data management, Business/Customer Support, Application Information Systems, and Delivery System.

1. Objective Title: NAL Preservation and Storage Program, Objective Number 4
2. Status: Continuing (C).
3. Objective Statement: To establish a Storage and Preservation Program to miniaturize and preserve the NAL's irreplaceable agricultural documents that are of significant interest to USDA, the agricultural scientific community, and the nation; and to provide a solution to the problem of adequate storage space.
4. Strategy: Several preservation and storage methodologies will be used to address the space problem the NAL is experiencing. One key methodology involves accelerating the development of electronic miniaturization storage and preservation technologies, which allow discarding of the original printed material while preserving the information content.
5. Program(s) Supported: This initiative will safeguard essential agricultural information to ensure future access by researchers and other users in the USDA, the land-grant system, and elsewhere.
6. Cross-cutting or Interagency Program Supported: This initiative directly supports USDA IRM objectives to integrate IRM and program planning and to use technology to support program delivery.
7. Background: It is widely recognized that the NAL collection constitutes an irreplaceable resource treasure for USDA, the nation, and the international agricultural scientific community. In addition to its broad coverage of agricultural topics, NAL's collection includes a wealth of unique information including original manuscripts; archival material; rare books; photo collection images and slides; maps; historical posters; botanical art, audio-visual material; oral histories; and one of the largest nursery and seed trade catalog collections in the world. The shelving space available for housing this collection in the Beltsville, Maryland, building will soon reach capacity. A recent space utilization rate study predicted that NAL will run out of stack space for books and journals in FY 95. Parts of the collection are also deteriorating as they age, due to the widespread use of acidic paper for printing in the second half of the 19th and first half of the 20th centuries. It is possible to both miniaturize and preserve parts of the collection by digitizing the publications. This method can also provide increase and more timely access to the publication through the use of electronic document delivery, CD-ROM technology, or the Internet.
8. Contact Name, Organization and Phone Number:
 - a. Evelyn Frangakis
 - b. National Agricultural Library, Preservation Officer
 - c. Phone: (301) 504-6503
9. Major Milestones:

	<u>Planned Start Date</u>	<u>Planned End Date</u>	<u>Actual End Date</u>
a. Develop storage and access requirements	06/94	09/94	
b. Select publications to be scanned	06/94	09/94	

c. Select a Service Bureau	10/94	10/94
d. Begin sending pubs to Service Bureau	12/94	
e. Purchase hardware & software for storage and access	04/95	
f. Load scanned pubs	04/95	09/95
g. Surplus printed version of pubs	10/95	

10. Resources:

	Thru							
	<u>FY97</u>	<u>FY98</u>	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03+</u>	<u>Total</u>
a. Total Cost	500	800	1000	1150	1150	1150	1150	6900
b. Staff Years	.5	1.5	3.5	3.5	3.5	3.5	3.5	19.5

11. Acquisition Description: Commercial services contract for miniaturization and book storage facility.

12. Departmental IRM Implementation Framework Area Supported: Information and data management.

1. Objective Title: Electronic Document Delivery, Objective Number 5.
2. Status: Continuing (C).
3. Objective Statement: To utilize advanced technologies to scan, store, transmit and receive page images via the Internet to facilitate delivery of documents to agricultural researchers worldwide.
4. Strategy: Use an Ariel document delivery system developed by the Research Libraries Group (RLG), which provides the capability to transmit and receive scanned page images via the Internet. This provides USDA field libraries and other USDA users and cooperating institutions the capabilities of the Internet for electronic document exchange.
5. Program(s) supported: This initiative supports NAL programs to organize, store, and improve access to agricultural information and coordinate with agricultural colleges, universities, private industry and others to develop a comprehensive agricultural network so as to deliver information in a timely, cost-effective manner.
6. Cross-cutting or Interagency Program Supported: This initiative directly supports USDA objectives to maximize information sharing and use technology to support program delivery.
7. Background: NAL, North Carolina State University, and 13 other land-grant university libraries collaborated in a pilot project conducted in 1991 and 1992 to transmit page images over the Internet using off-the-shelf software and MacIntosh hardware platforms. Following completion of the project in 1992, NAL sought alternative means of expediting document delivery. The implementation of an Ariel system of electronic document delivery provides NAL a capability for instantaneous delivery of documents throughout the United States, United Kingdom, Canada, Australia, Hong Kong, and several Scandinavian countries.
8. Contact Name, organization, and Phone Number:
 - a. Katherine Derr
 - b. National Agricultural Library, Public Services Division
 - c. (301) 504-6503

9. Major Milestones:

	<u>Planned Start Date</u>	<u>Planned End Date</u>	<u>Actual End Date</u>
a. Acquire initial workstations	01/93	06/94	
b. Set up & connect to NAL server	06/93	06/95	
c. Test system and provide training	07/93	08/93	1/94
d. Full production	07/93	08/93	6/94

e. Expand network	07/93	Continuous
To cooperators		

10. Resources:

	Thru							
	<u>FY97</u>	<u>FY98</u>	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03+</u>	<u>Total</u>
a. Total Costs	682	129	158	167	208	222	208	1774
b. Staff Years	10	3	4	4	5	5	5	36

11. Acquisition Description: Additional DOS-based Pentium microcomputers, laser printers, flatbed scanner, and Ariel software. Ethernet connections and file server are used. Costs for FY 1995 through FY 1999 include purchase of additional receive-only versions of the software to support the USDA Field Libraries and other USDA sites.

12. Departmental IRM Implementation Framework Area Supported: Information and data management.

1. Objective Title: Preserving USDA Digital Publications, Objective Number 6
2. Status: New (N).
3. Objective Statement: To effectively manage and preserve all of the Department's important digital information products and to make them broadly and reliably available to the American public.
4. Strategy: The National Agricultural Library will, in partnership with the Departments's Chief Information Officer, key representatives of the USDA mission areas, and other stakeholders, preserve selected USDA digital publications to ensure access to USDA publications relating to the food and fiber system, food safety, international compatibility, and other important topics.
5. Program(s) Supported: This initiative will contribute to REE goals by ensuring the future availability of critical information products which assist community leaders, business entrepreneurs, government agencies, and other public and private decision-makers in adopting policies and practices that improve, expand, and enhance local economic climates.
6. Cross-cutting or Interagency Program Supported: This initiative directly supports USDA IRM objectives to integrate IRM and program planning and to use technology to support program delivery.
7. Background: The digital publications produced as a result of new and existing Departmental program priorities need to be systemically identified, preserved, and archived before they are lost. As one example, when the 1995 edition of USDA's *Agricultural Fact Book* was made accessible in electronic form, its preceding electronic edition was removed from its location on a remote computer and was no longer available for use. USDA staff, government officials, and other citizens who needed that information could no longer access it electronically. NAL has a mandate to ensure access to all USDA publications, and is the appropriate organization to partner with USDA agencies, other federal agencies, and other stakeholders to capture, preserve, and provide access to these important electronic resources.

This initiative will allow NAL to inventory the universe of digital publications produced by USDA, develop standards and criteria for selection, pilot test a system to make the information contained in them available to those that need it now and in the future, and implement this system.

8. Contact Name, Organization and Phone Number:

- a. Evelyn Frangakis
- b. National Agricultural Library, Preservation Officer
- c. Phone: (301) 504-6503

9. Major Milestones:

	<u>Planned Start Date</u>	<u>Planned End Date</u>	<u>Actual End Date</u>
a. Inventory the universe of USDA digital publications	10/98	9/00	
b. Develop standards and criteria for selection	10/99	9/00	
c. Develop management Structure for preserving digital publications	10/00	9/02	
d. Purchase hardware & software for distributed storage and access	10/01	9/03	
e. Preserve digital publications	10/02	9/04	

10. Resources:

	<u>Thru FY97</u>	<u>FY98</u>	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03+</u>	<u>Total</u>
a. Total Cost	000	000	1000	1000	1000	1100	1100	5200
b. Staff Years	0	0	2	2	2	2	2	10

11. Acquisition Description: Purchase of hardware, software.

12. Departmental IRM Implementation Framework Area Supported: Information and data management.

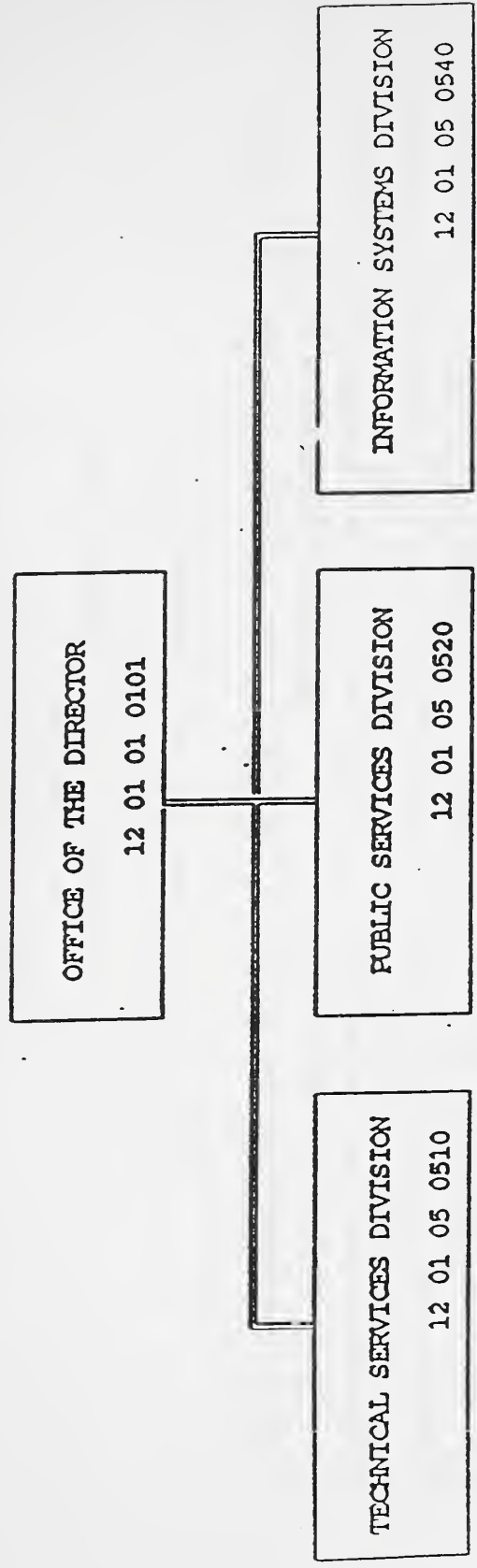
NATIONAL AGRICULTURAL LIBRARY

RECOMMENDED: Joseph W. Howard
Director, National Agricultural Library

CONCUR: Charles E. Henry
Assistant Secretary, Science and Education

APPROVED: Odia M. Vile 8/17/90
Assistant Secretary for Administration

DATE: AUG 28 1990

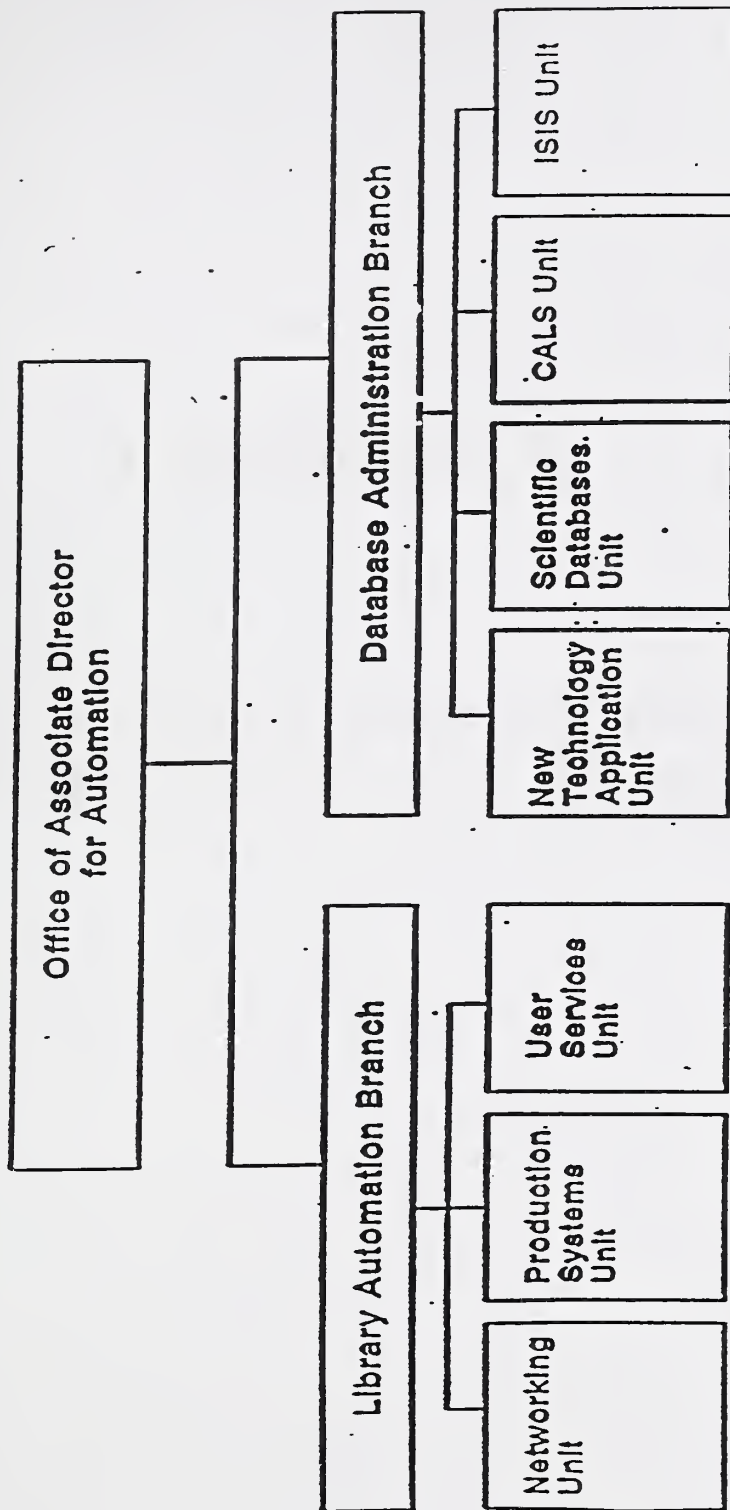


MISSION: The National Agricultural Library (NAL) serves as the Nation's chief Agricultural Information resource. It provides agricultural information products and services through traditional library functions and through modern electronic dissemination to agencies of the USDA, public organizations, and individuals. The NAL coordinates a national network of public and private libraries consisting of the land-grant colleges and universities, other state supported colleges and universities, other state supported colleges and universities with agriculturally related programs, other public organizations, industry, and other private sector organizations. The NAL provides a leadership role in U.S. participation in international agricultural library and information systems and in efforts to promote worldwide availability of agricultural information.

Advised chart dated January 29, 1988

Revised by the Personnel Policy and Administration Branch, Personnel Division, ARS

Information Systems Division Organization



CHAPTER III

Cooperative State Research, Education, and Extension Service (CSREES)

Cooperative State Research, Education, and Extension Service Information Resource Management Plan

FY 1998 - FY 2002

A. Agency and IRM Plan Overview

1. Introduction and Background

The new Cooperative State Research, Education, and Extension Service (CSREES) is positioned for the 21st century as a dynamic change agent and international research and education network. CSREES expands the research and higher education functions of the former Cooperative State Research Service and the education and outreach functions of the former Extension Service. The result is better customer service and an enhanced ability to respond to national priorities.

CSREES links the research and education programs of the U.S. Department of Agriculture and works with:

- Land-grant institutions in each state, territory and the District of Columbia;
- More than 130 colleges of agriculture;
- 59 agricultural experiment stations;
- 57 cooperative extension services;
- 63 schools of forestry;
- 16 1890 historically black land-grant institutions and Tuskegee University;
- 27 colleges of veterinary medicine;
- 42 schools and colleges of family and consumer sciences;
- 29 1994 Native American land-grant institutions;
- 127 Hispanic-Serving Institutions, including 81 members and 45 associate members of the Hispanic Association of Colleges and Universities.

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Mission

It is the mission of CSREES to achieve significant and equitable improvements in domestic and global economic, environmental, and social conditions by advancing creative and integrated research, education, and extension programs in food, agricultural, and related sciences in partnership with both the public and private sectors.

Focus

The heart of the CSREES results-oriented vision is to improve economic, environmental, and social conditions in the United States and globally. These conditions include improved agricultural and other economic enterprises; safer, cleaner water, food, and air; enhanced stewardship and management of natural resources; healthier, more responsible and more productive individuals, families and communities; and a stable, secure, diverse and affordable national food supply.

Programs

CSREES research, extension and education leadership is provided through programs in Plant and Animal Production, Protection, and Processing; Natural Resources and Environment; Rural, Economic and Social Development; and Families, 4-H, and Nutrition; Partnerships; Competitive Research Grants and Awards Management; Science and Education Resources Development; and Communications, Technology, and Distance Education.

The CSREES partnership with the land-grant universities and their representatives is critical to the effective shared planning, delivery, and accountability for research, higher education and extension programs.

Advanced Communication Technology

CSREES is a recognized international leader in the design, organization and application of advanced communication technologies and in meeting the growing demand for enhanced distance education capabilities. CSREES provides essential community access to research and education knowledge and connects the private citizen to other federal government information. All state extension system offices and 75 percent of county offices are interconnected via interactive communication technology. This capability enables CSREES to respond in a timely and credible manner to critical issues and public needs.

Reaching Diverse Audiences

Rural America is more diverse, both in human and financial resources, than ever before in our history. This diversity is vital to the CSREES mission to better serve our customers. CSREES is a diverse and multicultural organization that values and is committed to pluralism as a long-term investment in the future.

Making a Difference

CSREES focuses on critical issues affecting people's daily lives and the Nation's future. Advanced research and educational technologies empower people and communities to solve problems and improve their lives. CSREES responds to predominant quality of life problems --

improving agricultural productivity, creating new products, protecting animal and plant health, promoting human nutrition and health, strengthening children, youth and families, and revitalizing rural American communities. We accomplish this through strategic planning and the development of research and education programs in cooperation with our partners.

CSREES at Work

CSREES is the foundation for knowledge-based agriculture with its critical connection between extension educators identifying and communicating agricultural, environmental and community problems to the researchers back on campus and at the experiment stations. The generation of new knowledge serves to develop the next generation of scientists. Together they initiate and stimulate new research that provides the solutions to real world problems.

CSREES is

- Cutting edge research programs on value-added product development, plant and animal genome, integrated pest management, water quality, human nutrition, food safety, and animal and plant systems;
- Model education programs on food safety, sustainable agriculture, water quality, children, youth and families, health, environmental stewardship, and community economic development;
- 5.6 million youth involved in 4-H projects and programs;
- The National Research Initiative which supports research to solve key agricultural and environmental problems;
- Grants to provide agricultural and food sciences educational opportunities in professions where jobs outpace graduates by over 11 percent;
- Innovative design and development of interactive distance education activities to reach diverse audiences and sustain access to lifelong learning;
- Immediate electronic access to vital flood and disaster safety and recovery information;
- 3 million trained volunteers who work with outreach education programs nationwide;
- Over 9,600 local extension agents working in 3,150 counties;
- Over 9,500 scientists conducting research at 59 state agricultural experiment stations;
- Farm safety education programs in all 50 states and Puerto Rico;

- Pesticide applicator programs which train over half a million people each year in safe and environmentally sound pesticide use;
- International education programs taught by over 200 extension professionals in 17 countries.

For Further Information

Contact your local county extension office (offices are listed under local government in the telephone directory), a land-grant university or the Cooperative State Research, Education and Extension Service, U.S. Department of Agriculture, Washington, D.C. 20250-0900. Telephone: 202-720-3029; Fax: 202-690-0289; or contact via Electronic Mail: csrees@reeusda.gov

You may also access us via the Internet:

World Wide Web: <http://www.reeusda.gov>

Agency IRM Program

The Administrator's Executive Staff functions as the IRM Review Board. It consists of the Administrator, Associate Administrator, Deputy Administrator for Communications, Technology, and Distance Education, Deputy Administrator--Competitive Grants and Awards Management, Deputy Administrator for Families, 4-H, and Nutrition, Deputy Administrator for Plant and Animal Production, Protection, and Processing, Deputy Administrator for Partnerships, Deputy Administrator for Natural Resources and Environment, Deputy Administrator for Rural, Economic, and Social Development, Deputy Administrator for Science and Education Resources Development, Director of Civil Rights, Director of Legislative Affairs, and the Budget Director.

The Team Leader for Information Technology, with guidance from the Deputy Administrator for Communications, Technology, and Distance Education, serves as the Senior IRM Official. Seventeen people on the CSREES staff, plus six contract employees, are involved full-time in IRM activities. Thirteen of these individuals work full-time on the CRIS program at Beltsville, Maryland. The Team Leader for Information Technology, three IRM staff persons, plus six contractors devote full-time to CSREES automation support at the Washington offices. The Team Leader for Information Technology reports to the Deputy Administrator for Communications, Technology, and Distance Education.

2. IRM Planning Process

The IRM functions of CSREES are in the Communications, Technology and Distance Education unit and the Science and Education Resources Development unit of the agency. As part of the merger of

the Cooperative State Research Service and the Extension Service, the IRM staff was realigned and restructured to meet the needs of the new agency. The IRM planning process in the agency has been unaffected by the consolidation. Coordination with program units continues to be at the core of the IRM planning process. A Standards and Policy Council, with representation from all of the CSREES business areas, has been formed to bring insight and experiences...assist in formulating strategies and plans for agency Information Technology Architecture, models, and human resource development.

As major IRM proposals arise, CSREES appoints functional task groups to focus on the advantages and disadvantages of the new process or technology. The task groups are comprised of both program and technical representatives. In CSREES, a major IRM proposal is defined as any activity that affects more than one unit or exceeds \$50,000 in cost. The agency Budget Officer, and the Senior IRM Official have a direct involvement in planning for all aspects of agency IRM activities. All IRM related procurement exceeding \$100 must be reviewed and approved by both the Team Leader for Information Technology and the Deputy Administrator for Communications, Technology, and Distance Education.

3. Current IRM Environment

The CSREES Administrator's Office and all but one program unit are located in three buildings in downtown Washington, DC. The CRIS office is located in the National Agricultural Library (NAL) in Beltsville, Maryland. Data communications between the offices have been improving as technologies and budgets allow. The current agency backbone is an Ethernet LAN used with a combination of Novell and UNIX file servers and is directly connected to the Internet. The CRIS office has a PC-LAN running Novell network software and is connected to a Internet node at the NAL building. Each of the locations can communicate via electronic mail and have file transfer capabilities. The offices have a mix of personal computers running Windows software, with all systems at the 486 level of capacity or above.

CSREES employs a wide range of automation techniques and equipment to promote and manage agricultural research. This requires extensive communications with the non-Federal sector, as well as other Federal agencies. CSREES is currently making databases and files available to the public through conventional telecommunication methods and continues to be on the leading edge of internet-based technologies for methods of program delivery. The staff of CSREES is also able to take advantage of the vast amount of scientific resources on the Internet and the opportunities for collaboration on projects through the Internet.

CRIS is the major single IRM application in the Agency. CRIS serves as the USDA research project system and receives standardized input from the Rural Business-Cooperative Service (RBCS), Agricultural Research Service (ARS), Economic Research Service (ERS), and Forest Service (FS), in addition to CSREES and over 100 participating State research institutions. The CRIS database is maintained on the IBM mainframe at the National Computer Center - Kansas City (NCC-KCC). The CRIS PC-LAN (Novell NetWare) provides access to NCC-KCC and the

INTERNET as well as other outside networks. State participants prepare input to CRIS using specially designed PC-based programs. Data is submitted on diskette or electronically transmitted via the INTERNET. ARS provides data via magnetic tape and disk. FS is nearing completion of a system to provide CRIS data on tape as well. Data for the Human Nutrition Research Information Management System (HNRIMS) is received from the National Institutes of Health (NIH) via computer tape. Data from the Inventory of Canadian Agri-Food Research (ICAR) subfile and data from the Czech Agricultural Research Information System (CZARIS) subfile is also received via magnetic tape. CRIS, at the request of USGS/BRD, includes data in their current research projects. The complete CRIS Technical database is made available in an online mode, worldwide, to the private and public sector through DIALOG Information Services, Inc.; the National Technical Information System (NTIS) database Federal Research in Progress (FEDRIP); and through the World Wide Web system (<http://cristel.nal.usda.gov:8080>). The technical database is also available on CD-ROM through SilverPlatter, Inc..

The Food and Agricultural Education Information System (FAEIS) is administered by CSREES/SERD-Higher Education Programs (HEP) unit, and is managed by faculty and staff at Texas A&M University. FAEIS offers information on a broad range of higher education statistics related to the food and agricultural sciences. FAEIS presents national data from professional associations, a number of government agencies (e.g. U.S. Department of Education, National Science Foundation, Department of Labor, other Federal agencies), and other national databases. FAEIS offers an accessible resource of empirical information for use in planning and coordinating efforts directed towards supporting higher education in the food, agricultural and natural resource sciences. FAEIS data are used by the academic community (university and experiment station administrators and personnel), the USDA, congressional staff, media, libraries and industry. These data and other information related to agriculture, natural resources, forestry, family and consumer sciences, and veterinary medicine can be obtained through three methods: (1) Annual Reports provide summary information, (2) Specialized Information Requests provide more detailed information requiring additional analysis, (3) FAEIS ON-LINE, the electronic delivery component of FAEIS is designed to disseminate summary information representing the full spectrum of the FAEIS database. FAEIS ON-LINE contains over 400 summary data tables available on agriculture, natural resources, forestry, family and consumer sciences, and veterinary medicine, available through the World Wide Web (WWW) at home page location <http://agrinet.tamu.edu/faeis>.

Communications, Technology and Distance Education Unit

Communications, Technology, and Distance Education (CTDE) is a recognized leader in helping the nation build the National Information Infrastructure (NII) for agriculture. CTDE utilizes cutting edge communication technologies to provide the critical community access to quality of life research, education, and extension knowledge that empowers citizens to be active participants in reshaping society and solving complex problems at the local level.

Mission

The CTDE mission is to provide key community access to research and education through leadership

to the Cooperative State Research, Education, and Extension Service (CSREES) and its partners in the design, organization, and application of communication principles, information technologies, and distance education capabilities.

CTDE is committed to providing equal access to U.S. Department of Agriculture (USDA) and CSREES programs and facilities in all areas, including capital/workplace enhancement, community access and outreach, and educational technology consultation.

Focus

With an innovative integration of communication, access, technology and distance education, CTDE strengthens the public's ability to develop the research-based educational skills and knowledge essential to help individuals, families and communities help themselves. Regardless of where people are located, this crucial connectivity makes available a broader spectrum of global resources and enables more effective learning opportunities.

Communication

Communication is central to every facet of CSREES and the success of its mission. CTDE is often the first introduction many people and organizations have to CSREES. From the latest research initiatives to hot topic issues to fundamental mission-based national programs, CTDE articulates the agency's goals, impacts, and accomplishments across all program areas, presenting the total agency contribution and enhancing its outreach capability.

CTDE is a model of how customer-driven government should communicate and meet its citizens' needs. Its networked-based research and education decision support system positions CTDE to respond quickly and with credibility to emerging issues and public priorities.

Advanced Technology

As one of the earliest Internet leaders, CTDE designed and implemented an electronically-connected partnership linking the federal government, the State Agricultural Experiment Station System, Higher Education, the Cooperative Extension System with over 3,000 local offices nationwide, and other CSREES partners in the land-grant community.

CTDE pioneers new communication technology applications that achieve greater program effectiveness and more efficient use of resources. Examples include the network within a network concept of CYFERNet, an information infrastructure on children, youth and family issues, and Partners Against Violence (PAVNET). PAVNET is an online search and retrieval system providing access to information on programs to combat violence developed in partnership with the Departments of Education, Health and Human Services, Justice and Labor.

Distance Education

CTDE takes education across time and location to the community with distance education programs that are interactive, strongly learner-centered, and built upon a foundation of sound, research-based principles that truly sustains a lifetime of learning.

Combining technology with educational research, CTDE distance education programs are relevant to the variety of ways people learn. The learner is free from the constraints of time, space, format and content. Quality programs are available when, how, and where the learner wants to access them, enabling better understanding and better use of the knowledge gained. CTDE connects people to people and to global sources for teaching and learning that give both teacher and student the opportunity to maximize their potential.

Bridging The Information Age

Growing from the "library of Rural America" with its vast collection of print publications, today CTDE uses high performance computing and communications technologies to make current research-based knowledge easily accessible to the public. Whether it is global satellite broadcasting, World Wide Web, public access networks, compressed video, electronic meetings, or networked information discovery and retrieval systems, CTDE proactively develops and implements programs that promote equity of access and strengthen community support systems. Providing the bridge into the Age of Information is as important to rural America as the first farm-to-market roads were in the last century.

Leadership

CTDE cooperation and collaboration bring technology and people together in an information and educational network that makes programs and resources available locally and globally.

Through visionary thinking and strategic planning, CTDE is instrumental in guiding agency, mission area and USDA decisions about resource investment, networking, and information and education access at the local, state, and national level.

CTDE continues to model and demonstrate process and programs that reach across the federal government to help build a National Information Infrastructure that links local communities to USDA and other federal departments and empowers citizens to make their government better.

4. Accomplishments

World Wide Web Leadership: USDA Statistics can now be accessed through the World Wide Web thanks to CSREES funding and expertise provided to the Cornell University Mann Library. CSREES is continuing to work with the Mann Library to facilitate expansion of users served with a special focus on providing access to other USDA agencies. CSREES recently demonstrated its World Wide Web Home Page to other USDA agencies interested in Web developmental concepts and established an electronic discussion group for consultation activities with other USDA agencies.

CSREES is making available, electronically, notices of research grants, cooperative agreements, and contracts being solicited by USDA and other Federal agencies. The notices cover solicitations that are likely to be of interest to researchers of Colleges of Agriculture, Life Sciences, SAES, and other similar institutions. Initially, the solicitations will be taken from the Federal Register. The purpose is to provide researchers, research administrators, and contracts and grants officers with faster access to Federal solicitation notices. The Federal Register is the only notification source of many research solicitations. Many researchers and department and grants administrators do not have ready access to the Federal Register, and therefore do not have sufficient time to prepare and submit proposals before the solicitation due dates. Making notices available electronically from CSREES should alleviate this problem.

CSREES staff have undergone training to strengthen their electronic mail and inter-networking knowledge. The agency had developed a new Email Manual specifically for CSREES staff and the Internet. Coupled with this manual are formal training classes geared towards CSREES staff and their work. New employees are given an electronic mail manual and a video to help them become oriented in using electronic mail to accomplish their duties.

During the past year, CSREES has upgraded older equipment to increase productivity, enhance innovation and technology among users, and reduce the costs associated with maintaining obsolete equipment. The agency has upgraded all desktop computer equipment to at least the level of 486 processor power. The returns on the agency's commitment to educational and modern technology are producing measurable results.

The CRIS technical database was recently made accessible via the World Wide Web by CSREES/SERD/CRIS personnel. Hardware and software were purchased which allowed the CRIS staff to make the technical database available to the public through the INTERNET (via NETSCAPE or MOSAIC). This site provides public access to all technical data in CRIS records. Both full text and field searching, including use of Boolean operators, affords maximum retrieval capability for users. Easier and more widespread accessibility of current research information helps to improve research planning, avoid costly duplication and establish valuable personal contacts.

The Food and Agricultural Education Information System (FAEIS) is administered by CSREES/SERD-Higher Education Programs (HEP) unit, and is managed by faculty and staff at Texas A&M University. FAEIS responded to numerous inquiries about higher education trends in the food and agricultural sciences, by providing access to current and historical data. FAEIS data have resulted in positive public exposure for the food and agricultural sciences via media exposure, and substantial and complementary citations by two national studies: Employment Opportunities for College Graduates in the Food and Agricultural Sciences, 1995-2000, and Colleges of Agriculture at the Land-Grant Universities: A Profile.

Initial procedures were identified on the requirements necessary to move FAEIS ON-LINE from the GOPHER system to HTML language to facilitate access through WWW interfaces. A WWW-compatible front end to the existing GOPHER system was developed and implemented successfully.

FAEIS ON-LINE was updated with timely HEP Grants Information, thus providing a ready source of important, easy-to-access information about HEP competitive grant announcements, applications, and awards.

CSREES-OBJ1 "Agency-Wide Automation" has accomplished virtually all of the goals initially proposed. Connectivity among and between the multi-vendor PCS and file servers now exist and the scientific and support staff has been trained to make good utilization of the office automation hardware and software. Staff communication, both internal and external, has become more effective and productivity has improved as a result. This objective is an ongoing goal to continually

strengthen and build the technological skills and capabilities of CSREES.

CSREES-OBJ2 "Enhancing CRIS Operating Technology" has been revised to take advantage of new technologies that have recently been developed. The new approach is described in the new objective "Current Research Information System Enhancement Plan."

CSREES-OBJ3 "Research, Education, and Economics Information System" is being designed, developed, and implemented as a platform linking/interrelating research, extension, education, and economics/statistics data and information systems conducted or supported by the REE mission agencies and which focus on the food and agricultural sciences, natural resources and rural development.

5. Future Direction

Communications, educational and information systems will be augmented or developed for use by the Mission Area and its partners. The goal is to create and expand systems based on audience needs. These systems will: encourage development of collaborative work environments; interactive educational opportunities; and enable staff to update and access rapidly changing information. Access to these systems will be tied to the capacity of the audience/learner and will reflect quality and accuracy; and ensure privacy.

In the 1990's and beyond, one of the greatest challenges to the food and agricultural system will be to understand society's concerns regarding technological innovation and its impact on the environment and human health. The system must provide complete and balanced information about the opportunities and risks associated with the uses of biotechnology, genetic engineering, and other scientific advancements. Solutions to some of the Nation's most pressing problems are inexorably tied to basic research that enables science and education to address issues as they arise. Developing environmentally compatible agricultural production practices, increasing the global competitiveness of U.S. food and agricultural products, improving the safety and nutritional quality of the Nation's food supply, and attaining food production levels that match rapid growth in the world's population are just a few areas where progress in achieving successful solutions requires the discovery and application of new knowledge and technology.

The CSREES National Research Initiative Competitive Grants Program (NRI) was initiated in FY1991 with an appropriation of \$73 million and authorization for funding at \$500 million. The NRI currently funds predominantly basic research, with a minimum of 30 percent mission-oriented funding, in selected high-priority areas including: Natural Resources and the Environment; Nutrition, Food Quality and Health; Animal Systems; Plant Systems; Markets, Trade and Policy; and Processing for Adding Value or Developing New Products. FY 1996 funding is \$96.7 million with the President's Budget Proposal requesting \$130 million for FY 1997. The NRI currently relies heavily on IRM technology both in proposal management and distribution of information to customers. A significant increase in funding will increase information distribution needs and require additional scientific and support staff along with personal computers and network training to make

most effective use of their abilities.

At present, the Internet provides linkage to virtually all the SAES, Forestry Schools, Veterinary Colleges, Tuskegee University and the Land-Grant Schools of 1890, as well as other public and private institutions. CSREES will concentrate on improving the ease and speed of communications with State institutions and will make a number of in-house databases and directories directly accessible.

The CRIS system will take a multi-faceted approach to enhancement by (1) concentrating on PC-based systems and World Wide Web functionality for our State/Federal partners for data preparation and data input, and by (2) providing direct access for CRIS users and the general public to extract and manipulate data. Currently, a cooperative agreement with the University of Arizona has been established to assist in the enhancement of the CRIS to meet current needs of USDA and the cooperators. CRIS is constrained today by outdated technologies, a taxonomy that does not include recently emerging areas of science, and an inability to provide program data, in addition to project data, in a manner easily understood by the user base. Also the system cannot adequately identify current and emerging national issues.

The FAEIS system will continue to maintain high standards for data quality, customer service and information access. FAEIS plans to enhance FAEIS ON-LINE by making all on-line files accessible to the WWW. FAEIS also plans to upgrade databases with modern, advanced software.

The agency looks forward to the success of the "Modernization of Administrative Process" (MAP) program. There has been a longstanding need in USDA to eliminate unnecessary administrative procedures and paperwork and coordinate and consolidate the various automated systems. MAP has to be a USDA wide effort due to the scope of the problem. However, for specific needs in the administrative area, CSREES plans to evaluate imaging systems and the like as a way to replace the inefficient, large volume hard copy files with a modern electronic filing system. This will provide easier and more wide-spread access to project records.

Preliminary to the design of REEIS, a plan for conducting a strategic information audit within the REE mission agencies is being formulated. Phase I of the audit will involve the preparation of a comprehensive inventory of REE mission agency databases/information systems that will ultimately reside on the REEIS platform, preparation of an automated data dictionary, the development of specifications for the follow-on needs assessment, and development of specifications of a universal language to serve as an interface for REEIS.

Phase II will involve the conduct of a comprehensive needs assessment within the REE mission agencies and their partner institutions. This is expected to provide the foundation for the design and development of the REEIS system. Sustainable products resulting from Phase II include an information system management plan and information policies relating to standards, sustainability issues (e.g., WWW, stand alone vs. distributed), information processing requirements, and decision support tactics.

The design, development and implementation phases, including the development, testing and evaluation of a prototype system, will be targeted for completion on the basis of results of preceding phases.

B. Agency IRM Objectives

1. Objective Title: OBJ1 - Agency-Wide Automation
2. Status: Revised
3. Objective Statement: Develop an office environment where up-to-date user friendly technologies are available for all scientific and support staff to use. Improve individual and overall productivity through a combination of office automation and telecommunications. Increase staff usage of the Internet system to provide improved services to and communications with State partner research institutions. Emphasize automation of client driven programs. This objective has no hard ending dates and is continuously evaluated and updated.
4. Strategy:
 - a) Develop and implement a strategic plan.
 - b) Develop connectivity between multi-vendor PCS and network systems.
 - c) Acquire appropriate software to support office automaton.
 - d) Train scientific and support staff to make efficient use of hardware and software.
 - e) Emphasize the use of telecommunications in the accomplishment of duties.
 - f) Automate some universal staff functions such as project review and electronic filing systems.

5. Program Supported:

This objective contributes to the following agency mission-oriented objective: 1) to develop, analyze and present information on the needs and accomplishments of agricultural research, education, and extension; 2) to improve the effectiveness of existing and new processes established for the delivery and accountability of Federal resources; and 3) to improve cooperation with other State, Federal, and private participants.

6. Cross-Cutting Programs Supported:

Support of all USDA Cross-Cutting Programs is improved through improved automation and communication among Federal and State scientists.

7. Background:

Information technology was integrated into the business of the predecessor agencies of CSREES and has been enhanced since the reorganization. A major workplace enhancement effort was initiated in FY 1995 and is ongoing. The workplace enhancement effort consolidates all agency computer workstation procurement initiatives within the CTDE unit. Additionally, training on the use of computers and applications throughout the agency has been coordinated by the CTDE unit.

CSREES has pioneered the implementation of networked information discovery and retrieval throughout the Department. The agency has developed resources that leverage the power of the Internet to provide improved customer access to its' programs and information.

8. Contact Name: Jerome J. McNamara
Organization: Cooperative State Research, Education, and Extension Service
Phone Number: 202-401-0951

9. Major Milestones

	<u>Planned</u>		<u>Actual</u>
	<u>Start Date</u>	<u>End Date</u>	<u>End Date</u>
a. Develop a strategic planning document for CSREES.	Dec. 1994	Ongoing	
b. Develop a strategic plan for Implementation of Technology within CSREES.	Jan. 1995	Ongoing	
c. Analyze hardware and software infrastructure.	Jan. 1995	Ongoing	
d. Acquire needed infrastructure upgrades.	Aug. 1995	Ongoing	
e. Analyze user desktop needs.	Jan. 1995	Ongoing	
f. Acquire and install equipment.	Aug. 1995	Ongoing	
g. Implement New Software and train staff.	Sept. 1995	Ongoing	

10. Resources FY96 FY97 FY98 FY99+ TOTAL

Total Costs (\$000)	360	225	225	300	1,110
Staff Years	2.0	2.0	2.0	2.0	2.0

11. Acquisition Description

FY 1995 - Acquisitions to begin the replacement of old equipment (\$192,000).

FY 1996 - Routine acquisitions to replace obsolete equipment (\$360,000).
Acquisitions brought operational infrastructure and desktop resources
in line with current needs. Future acquisitions will follow a schedule
and should not need the expenditures to be as severe as in this FY.

FY 1997+ - Acquisitions to replace 1/3 of the computer equipment on an annual basis.

12. Department IRM Implementation Framework Supported

- * Business and Customer Support
- * Information and Data Management
- * Delivery Systems.

B. Agency IRM Objectives

1. Objective Title: OBJ2 - Current Research Information System (CRIS) Enhancement Plan
2. Status: Revised
3. Objective Statement: Make the CRIS more effective and efficient in its computer operations and more user-friendly and useful to State and Federal users.
4. Strategy: (1) Develop and implement strategies and mechanisms for improving CRIS in order to meet the needs of its clientele. (2) Develop a means for CRIS to evolve in order to reflect new and emerging areas of agricultural research. (3) Improve the systems responsiveness and accessibility to research managers, research participants, and clientele. (4) Develop an accountability and accomplishments reporting process to comply with the new GPRA. (5) Develop a bridging concept that will enhance CRIS's ability to become an integral component of the future, more comprehensive REE Information System.
5. Programs Supported: This objective contributes to the following agency mission-oriented objectives: 1) to develop, analyze, and present information on the needs and accomplishments of agricultural research and higher education; 2) to effectively manage agricultural research and higher education projects, structures, and institutions.

CRIS addresses research information needs by providing a database of all research sponsored or conducted by the USDA as well as over 100 cooperative State research institutions. The technical information in the CRIS database is made available to USDA and state scientists and other public or private individuals and institutions both online and on CD-ROM by commercial and Government organizations. It is also available via INTERNET. The fiscal data (not available to the public) in the database is used by research managers to help them manage their programs more effectively.

6. Cross-Cutting Programs Supported: CRIS is an interagency program which is funded by and supports the research programs of ARS, CSREES, ERS, FS, and RCBS. In addition, HNIS, USGS/BRD, Czechoslovakia, Canada, and OICD contribute data to CRIS.
7. Background: The CRIS was established in the late 1960s as a database on agricultural research conducted by or through USDA agencies and their cooperators. CRIS presently contains data on over 35,000 current or recently completed projects. Coverage includes projects conducted by USDA's research agencies, 58 State Agricultural Experiment Stations, 14 Forestry Schools, 28 Schools of Veterinary Medicine and 16 1890 Colleges plus Tuskegee University. Research funded under the USDA National Research Initiative Competitive Grants Program and CSREES's Special Grant and Cooperative Agreement Programs are also included in CRIS. Despite this broad coverage of research, CRIS is constrained today by outdated technologies, a taxonomy that does

not include recently emerging areas of science, and an inability to easily provide program data. Also, the system cannot adequately identify current and emerging national issues.

This initiative is being conducted via a Cooperative Agreement with the University of Arizona (Drs Colin Kaltenback and Kurt Feltner) and will use a national steering committee approach to establish and guide the overall approach to design, develop, test and implement proposed enhancements to CRIS. This group will include both users and producers of agricultural research data. The advisory committee will help guide a smaller working group that will create specific assignments and timetables for a number of technical experts needed to develop and implement the planned enhancements to CRIS, assist in engaging them and monitor, guide and coordinate their efforts.

8. Contact Name: Theodore K Bauer
Organization: CSREES/SERD/CRIS
Phone Number: 301-504-5847

9. Major Milestones:

	<u>Planned</u>		<u>Actual</u>
	<u>Start Date</u>	<u>End Date</u>	<u>End Date</u>
a) Ariz meet with key individuals to confirm specific goals	02/96	02/96	02/96
b) Identify and recruit for small working groups and larger Advisory Committee	03/96	03/96	03/96
c) Working Group outline plan of work and specific approaches	05/96	05/96	05/96
d) Meet with Advisory Group to review product of Work Group	06/96	06/96	06/96
e) Revise Work Group Plan of Work as needed	07/96	07/96	08/96
f) Recruit Technical Experts	08/96	08/96	08/96
g) Monitor, coordinate and guide technical experts	09/96	12/96	12/96

h) Combined meeting of Work Group, Advisory committee and Technical Experts to review and evaluate	01/97	01/97	01/97
i) Guide and coordinate activities of Technical Experts	02/97	03/97	04/97
j) Publish and report recommendations	04/97	06/97	

10. Resources:

	FY 96	FY 97	FY 98
Total Costs (\$000)	\$43.4	\$56.6	0.0
Staff Years	2.0	2.0	0.0

11. Acquisition Description:

The CRIS LAN and CRIS staff personal computer swill be upgraded in order to run Windows NT. The enhanced capabilities will provide connectivity options not currently available. Estimated cost is \$26,000. CRIS also anticipates the need for contractor support in order to provide access to fiscal data via the WWW. Cost of this effort is estimated at approximately \$55,000.

12. Departmental IRM Implementation Framework area supported:

- *Information and data management
- *Application information systems

Agency IRM Objective

1. **Objective Title.** OBJ3 - Research, Education, and Economics Information System (REEIS).

2. **Status.** New

3. **Objective Statement.** Design, develop and implement a state-of-the-art information technology system which will serve as a platform for linking/interrelating research, extension, education, and economics/statistics data and information systems conducted or supported by the REE mission agencies and which focus on the food and agricultural sciences, natural resources and rural development.

4. **Strategy.**

- Establishment of a REEIS National Steering Committee with broad Federal and state participation is underway. The Committee will be charged with guiding the overall approach to designing, developing, testing, and implementation of the proposed system.
- A plan for conducting a strategic information audit within the REE mission agencies is being formulated. Phase I of the audit will involve the preparation of an inventory of REE mission agency databases/information systems. This will serve as input to Phase II of the audit which will involve a comprehensive information needs assessment that will provide the foundation for the design and development of the REEIS system.
- It is anticipated that contractor services and arrangements through grants and/or cooperative agreements with our partner institutions will be utilized throughout the development and design stages of REEIS. Where practical, off-the-shelf technologies and software will be utilized.
- The design, development and implementation phases, including the development, testing, and evaluation of a prototype system, will be targeted for completion on the basis of results of the preceding phases.

5. **Program(s), Core Processes and GPRA Goals and Objectives Supported.** The REEIS initiative is in support of the five basis REE strategic objectives detailed in the REE Strategic Plan (see URL: <http://www.reeusda.gov/ree/ree1.htm>); overall REEIS objectives are included in the Communication and Information Access section of Strategic Initiatives under Management and Organizational Strategies in the REE Strategic Plan. The goal of Strategic Objective 4 under Management and Organizational Strategies is to "encourage easy, timely, and complete communication of REE knowledge." In this initiative, information systems will be augmented or developed for use by the mission area and its partners. Additionally, Strategic Objectives and Initiatives in the REE Strategic Plan specifically reference expanding, sharing, and developing knowledge and information for facilitating decisionmaking and ensuring that policymakers and program managers have timely and objective data.

It is envisioned that REEIS will operate as a platform to link/interrelate many different databases serving extension, research, education, and other agency functions. The proposed comprehensive REE-wide system will provide a single source of information on a wide variety of programs and projects conducted across the nation with USDA funding. It is planned that the system satisfy program and budget accountability requirements. The system would provide real-time tracking of projects and programs in the mission-area agencies; enable communications among field, state and Federal locations; facilitate assessment of technologies and practices employed in extension, education, economics and research activities at the field, regional and/or national levels; provide ready public access to relevant parts of the information; and provide management tools to enhance the timeliness and accuracy of responses to inquiries about program emphasis and expenditures. With data on outputs and outcomes, REEIS will bring more information to bear on key management decisions. A common baseline can be established for multiple programs and projects. Longitudinal comparisons will document trends with real-time tracking of research, extension, and education projects and programs. Data will be compiled for tracking and assessing technologies and practices used in extension, education, economics, and research activities.

6. Cross-Cutting or Interagency Program(s) Supported. The REEIS National Steering Committee will include broad representation from REE agencies, as well as research, extension, and education faculty and administrators from participating partner institutions. Participation by technical experts, database managers, and mid- and senior-level managers and administrators in activities of the Steering Committee, including discussion and work groups, will provide the technical and management expertise required for guiding the design, development, testing, validation and implementation of REEIS. Information systems of other Federal agencies including Department of Energy, National Science Foundation, and National Institutes of Health will be represented.

7. Background. REE mission agencies currently maintain or support numerous and diverse databases and information systems that have proved useful to their individually targeted groups of users. While each of these databases serve a specific set of users, the need has developed for a comprehensive state-of-the-art information technology system to serve as a single available source of data and information that will enable the REE mission agencies and their partners to rapidly and accurately conduct policy assessments as well as evaluation analyses of research, education, extension, and economics programs and projects.

The Government Performance and Results Act (GPRA) also imposes reporting demands on information which is not currently available from one central site.

The Federal Agriculture Improvement and Reform Act (FAIR) of 1996 authorizes the development of a state-of-the-art information technology system to monitor and evaluate agricultural research and extension activities conducted or supported by USDA. The Act specifically calls for a comprehensive review of state-of-the-art information technology systems and to develop and carry out a system that will enable the measurement of the impact and effectiveness of research, extension, and educational programs according to priorities, goals, and mandates established by law.

8. Contact Name, Organization, and Phone Number.

Dr. K. Jane Coulter, Deputy Administrator
Science and Education Resources Development
Cooperative State Research, Education, and Extension Service
Phone: 202-720-3377

9. **Major Milestones.** The REEIS National Steering Committee held its first meeting in Washington, D.C. on June 25-26, 1997. Committee activities included an overview of REE databases and information systems currently maintained or supported by the REE mission agencies, exploration of the needs and uses of information by specific category of user, a listing and prioritization of specific system attributes identified as components of the new system, and discussion of specifications for the development and design of the system. The Committee is establishing several work groups for the purpose of providing detailed technical expertise required to guide and monitor activities of the REEIS project.

A program analyst position has recently been filled on the new staff. The Director of the project is expected to be filled through use of an Intergovernmental Personnel Act (IPA) assignment from the university community in the Fall of 1997.

A Web site has been established on the Internet for the system. Current project status is available and mail can be received by the system. The URL is:

<<http://www.reeusda.gov/ree/reeis/reeis.htm>>

10. Resources. Thru

	<u>FY97</u>	<u>FY98</u>	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>Total</u>
Total Costs (\$000)	400	1,000	2,000	2,000	2,000	2,000	9,400
Staff Years	1.0	3.0	3.5	4.5	4.5	4.5	21.0

11. Acquisition Description.

FY 1997 - Upgrades of PC work stations to include new personal computers and later versions of standard office application software (\$6,000).

Phase I of Strategic Information Audit. Includes Database Catalog, Data Dictionary, Specifications for Phase II Needs Assessment, Specifications for Universal Language (\$140,000).

FY 1998 - Phase II of Strategic Information Audit. Includes Comprehensive Needs Assessment, Universal Language (\$200,000).

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

DRAFT

STRATEGIC PLAN

Document available electronically on the World Wide Web
<http://www.ree.usda.gov/part/gpra/gprahome.htm>

Submitted for Review

5/28/97

Note: The use of CSREES in this strategic plan assumes an on-going partnership between CSREES, a Federal agency and it's numerous partners who are responsible for implementing a broad range of research, extension and education programs at the State, county and local levels.

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Foreword

The Cooperative State Research, Education and Extension Service (CSREES) is a unique Federal agency. In USDA, the agency has primary responsibility for providing linkages between the Federal and State components of a broad-based, national agricultural research, extension, and higher education system. Focused on national issues, its purpose is to represent the Secretary of Agriculture and the intent of Congress by administering formula and grant funds appropriated for agricultural research, extension, and higher education. In addition to its national leadership in setting research and education priorities, it provides a means of feedback from the states to Congress and the Executive Branch of Government, communicating local, regional, and national priorities.

In administering Federal formula and grant funds, CSREES is responsible for the major extramural programs of USDA that sustain high-quality research and education initiatives. The agency is concerned with planning ways in which the Federal and State partnership will respond to research and educational needs for the common good of agriculture and our Nation.

The CSREES strategic planning process complements the planning efforts of the USDA and becomes a flexible instrument for establishing five year goals, priorities and implementation strategies. The strategic planning process therefore will be a useful guide for the efficient and responsive allocation of national food and agriculture research and education. It will prepare American agriculture to meet the 21st Century's primary challenges - finding environmentally and economically sustainable ways to develop the most successful agricultural production system in history utilizing the partner resources of the U.S. Department of Agriculture and the expertise of scientist and other professionals at colleges, universities and public and private laboratories.

We appreciate the interest and support of CSREES senior program staff and partners who contributed in the development of this strategic plan, and look forward to continued dialog that will produce revisions that will further strengthen research and education related to agriculture and the environment.

B.H. Robinson
Administrator

June 3, 1996

Introduction

The Congressionally mandated Government Performance and Results Act (GPRA) of 1993 requires Federal agencies to prepare strategic plans that provide an overall guide to the formulation of future agency budget requests and "management for results." The CSREES Strategic Plan developed in accordance with GPRA requirements outlines agency expectations for agricultural research, education, and extension over the period 1997-2002. It also provides a mechanism for assessing and redirecting agency programs to achieve strategic goals.

As one of four agencies in the Research, Education, and Economics (REE) Mission Area, CSREES initiated its strategic planning process in the spring of 1994 in consultation with university partners. The plan is linked with the plan of the REE Mission Area and serves as a point of engagement with the USDA Chief Financial Officer, the Office of Management and Budget (OMB), and Congress in the planning, conduct, and evaluation of research and education programs.

The plan represents the cooperative work of administrative and program staff and reflects the planning of CSREES and its partners with input at the Federal, State and local levels. It assures a focus on planning and on attaining measurable outcomes and net impacts in the CSREES program areas and provides for accountable management of funds in response to broad National and State priorities. The plan delineates the critically important cornerstones for research, extension and education efforts for the base programs (Smith-Lever 3(b) & (c); 1890 Institutions-Extension Programs; Hatch; McIntire-Stennis; Cooperative Forestry; Evans-Allen; and Animal Health and Disease Research), and competitive and special grants.

Management oversight is the responsibility of the CSREES Partnership Working Group, comprised of CSREES and partner administrators, which monitors program design, implementation, and evaluation at the Federal level; reviews the status of reports; serves as the primary information link to CSREES and the university partners; and recommends appropriate actions to the CSREES Administrator. The strategic plan will be continuously reviewed and updated to respond to new and emerging issues important to citizens and the Nation.

The Environment for Agency Planning and Operating

A number of domestic and international factors, including economic, social, political, technological, informational, educational, and environmental trends, will influence the implementation and evaluation of the CSREES strategic plan. Research, higher education, and extension programs are essential to help U.S. citizens, agricultural and food industries, and the government respond to many complex social, environmental, and economic issues. As global issues, they affect U.S. competitiveness in international markets. Long-term investment in research, higher education, and extension will provide effective ways to address national issues and priorities.

Internal Environment

Several trends at USDA will affect the internal environment within which CSREES will function. Departmental and agency downsizing, in accordance with the National Performance

Review, will continue. This may result in the elimination or privatization of some programs and responsibilities; the devolution of programs and responsibilities from the federal agency to other entities; regulatory reform, and increased cooperation and coordination across programs.

Resources for CSREES programs also are expected to continue to decline. In recent years, CSREES appropriations for base programs have decreased by 1.5-2.5 percent annually, in inflation-adjusted dollars, although funding for other programs has increased. The ratio of formula or base program funding (e.g., Hatch, McIntire-Stennis, Evans-Allen, Animal Health and Disease, and Smith-Lever 3[b] and 3[c]) to nonformula funding is likely to continue to decline. Funding for special initiatives, however, is expected to increase.

An increasing portion of federal and state-appropriated funds will be distributed competitively. The need to justify the continuation of science-based programs through applied research and impact assessment will increase. Inside and outside government, the debate over the federal government's role in applied research and technology development will continue, as will concern over the amount of funds expended on fundamental research. Public concern about the quality and validity of scientific research and public education also is expected to continue, as is public interest in environmental issues and demand for an economical, safe, and wholesome food supply. Progress will be made in conveying the impacts of scientific research and its applications to the public, thereby bolstering public trust in science.

External Environment

A number of factors external to USDA and CSREES also will affect the agency's environment. Continuing increases in both global population and per-capita incomes over the next 10 years are expected to result in a strong increase in the demand for food. This development could have a dramatic impact on many aspects of American agriculture. The U.S. economy is expected to grow steadily, with the Gross Domestic Product outpacing inflation each year for the next decade.

Some groups of stakeholders and customers have high expectations that research, higher education, and extension will help them address important issues. These stakeholders and customers range from commodity groups, producers, and processors to health care providers and environmentalists. In this political and social environment, careful attention to the identification and pursuit of critical national priorities will help maintain the agency's successful record in strengthening our Nation's ability to compete in the global marketplace. This will occur in a context of burgeoning international interdependence and competition vis-a-vis the export of U.S. agricultural science and technologies.

Pressures on federal program benefits will result from changing federal policies, particularly those arising from revisions of the Farm Bill; the need to comply with new regulations; international trade agreements; and declining continuing constraints on budgets to support research and education. Consequently, little or no growth is expected to occur in farm production subsidies, and in some cases they will be substantially reduced or eliminated. The current focus on global environmental issues and their impact on agriculture is expected to continue. Similarly, budget constraints are likely to necessitate reduced state and local funding for research, higher education, and extension activities at land-grant universities and other

institutions. This has already led to reductions in the number of faculty members in the food and agricultural sciences.

Because of consolidation and reductions in programs, the strong need for coordination among universities, USDA and other Federal agencies, and other institutions will continue. The long-term effect of reduced funding will be a diminution in the availability of scientists for agricultural research and of professional workers for the entire system. However, the increasing complexities of conducting science and business in the future will require more highly educated workers with degrees in the food and agricultural sciences.

Recapturing excellence in education to meet growing national and international challenges will require dedicated effort on the part of all segments of the Federal Government. CSREES must work to improve the image of agriscience and agribusiness, to strengthen undergraduate and graduate education, and to provide a more diverse scientific and professional workforce in the food and agricultural fields. Currently, employers' needs for graduates in many food and agricultural science areas (e.g., marketing and merchandising) are not being met. This is true despite the fact that employers have turned to graduates in disciplines allied with the food and agricultural sciences.

The Federal Government's role in applied research and technology development will continue to be debated, as will concerns about funds for fundamental research. CSREES programs will be required to justify their existence on a regular basis. Although the successful record of the land-grant university system in partnership with USDA provides a sound basis for significant future contributions, this system will have to be justified repeatedly. Increased emphases on economic, environmental, and sociological assessments will be necessary to document the benefits of publicly supported research and education programs.

The debate over environmental, agricultural, and social issues will challenge policy makers to find a balance among regulatory, educational, and voluntary approaches to attainment of an economically, environmentally, and socially sustainable agriculture. CSREES will work with university partners, other Federal agencies and private sector organizations, as appropriate, to address these challenges successfully. To resolve issues of sustainable agriculture under complex environmental and social conditions requires well-educated and well-informed producers, processors, and consumers of food, fiber, and other natural products.

Complex issues affecting children, youth, families, and the elderly will challenge the coping abilities of communities and families to sustain and enhance individual and community development. Research in the interests of the "social good" will continue to be valued highly. The need to integrate research, higher education, and extension programs to help children, youth, families, and communities address social issues more effectively will place greater demands on CSREES and its state, Federal and private sector partners. These demands will involve tasks such as development of local collaborations, generation of effective programs, and demonstration of measurable results.

The technological advances of the 20th century set the stage for CSREES and its partners to enhance access to the information base of our land-grant partners. Given societal change and the direction of the technological future, all citizens will need ready access to lifelong research-based

information. However, the expansion of the volume of information and the inequalities of access to education and information via communications technology comprise two major issues confronting CSREES and its partners. CSREES will be challenged to help all citizens interpret research information on topics in the food and agricultural arena; to enable policy makers to respond to critical concerns; and to link researchers, customers, organizations, and policy makers nationwide. Research and education must be viewed as essential to the effective resolution of these issues.

The Federal/State Partnership

In September 1994, Congress authorized the establishment of the Cooperative State Research, Education, and Extension Service (CSREES). This new agency was formed as a result of efforts by the Legislative and Executive branches of government to streamline Federal agencies, including the USDA, and to increase its efficiency and effectiveness in serving the nation. CSREES combines the missions, resources, personnel, and responsibilities of the former Cooperative State Research Service (CSRS) and the Extension Service (ES). It is the primary Federal link to university and other partners in cooperative programming in the food and agricultural sciences. The universities are partners in carrying out the agency's mission and achieving its goals with Federal funding.

Although CSREES does not exercise line authority over its partners, it does have certain statutory oversight responsibilities and authority for the funds that it channels to these institutions and individuals. This holds true whether CSREES funds constitute the sole source of a program's funding or only a minor source of support. CSREES-administered funds provide land-grant institutions and other partners with stable, readily available support, thereby leveraging additional human and financial resources, three to four-fold, thus the benefits derived to society are the result of public and private investment.

Legislative Authorities

Research and education programs administered by CSREES are USDA's principal entree to the university system of the United States for the purpose of conducting agricultural research and education programs as authorized by the Hatch Act of 1887, as amended (7 U.S.C. 361a-361i); the Smith-Lever Act of May 8, 1914, as amended; the Cooperative Forestry Research Act of 1962, as amended (16 U.S.C. 582a-7); Public Law 89-106, Section (2), as amended (7 U.S.C. 450i); and the National Agricultural Research, Extension, and Teaching Policy Act of 1977, as amended (7 U.S.C. 3101 et seq). Through these authorities, USDA participates with State and other sources of funding to encourage and assist the State institutions in the conduct of agricultural research and education through the State Agricultural Experiment Stations and the Cooperative Extension Service of the 50 States, the District of Columbia and the territories; approved Schools of Forestry; the 1890 Land-Grant Institutions and Tuskegee University; Colleges of Veterinary Medicine; colleges of agriculture; schools and colleges of family and consumer services; Native American Land-Grant Institutions; Hispanic-Serving Institutions; and other eligible institutions. The funds appropriated provide Federal support for research, education, and other programs at these institutions.

The State institutions conduct research and experiments on the problems continuously encountered in the development of permanent and sustaining agriculture and forestry, and in the improvement of the economic and social welfare of rural and urban families. Because of differences in climate, soil, market outlets, and other local conditions, each State has distinct problems in the production and marketing of crops and livestock. To address these problems, farmers, foresters, and rural residents in the individual States naturally look to their State Agricultural Experiment Stations, universities, and colleges for solutions.

The State institutions also provide a national network of educational programs that are pledged to meeting the country's needs for research knowledge as a basis for practical decision making. This need is met through the Cooperative Extension System, which helps people improve their lives through an educational process that uses scientific knowledge focused on issues and needs. These nonformal educational programs improve American agriculture, communities of all sizes, and strengthen and sustain individuals and families throughout the Nation.

The Department's higher education mission is carried out in strong alliance with States, universities and the private sector. Recognizing the significance of this alliance, the Food and Agriculture Act of 1977 designated USDA as the lead Federal agency for higher education in the food and agricultural sciences. Through CSREES, USDA has implemented its charge with a broad array of initiatives to link teaching, research, and extension and to improve the training of food and agricultural scientists and professionals.

Cooperation is key to the success of research, education and extension programs at State institutions. To be most effective, cooperative efforts include participation in local, state, regional, and national programs. Joint effort by a group of State institutions is the most effective and often the only practical approach to problems of common interest. The research, education and extension components are acting together as regional groups to provide cooperative, coordinated attacks on problems of regional and national interest. In a similar manner, the research programs of the State institutions and the Department of Agriculture are complementary and interdependent.

Federal and State Budgets

In administering an annual budget of approximately \$908 million for FY 1996, the Cooperative State Research, Education, and Extension Service (CSREES) had a staff of approximately 380 Washington, DC- based staff. Through the land-grant university partnership, 75 universities work in close cooperation with CSREES, employing more than 9,500 scientists, and 9,600 extension educators and engaging nearly 3 million volunteers supporting activities in the 50 states (3,150 counties), the District of Columbia, and the six territories (Puerto Rico, the Virgin Islands, Guam, American Samoa, the Northern Marianas and Micronesia). The scientific and educational staff base of the land-grant universities is expanded through the participation of scientists and educators from other non-land-grant universities and private sector organizations. These professionals participate in a number of competitive grant opportunities related to the research and education mission of CSREES. Research and education programs respond to national, regional and state needs, and the American consumer benefits in the form of safe, wholesome and affordable food, fiber, and other renewable resources. At these institutions,

approximately 100,000 students are trained each year in academic programs in agriculture, human development, and natural resources.

The Federal formula funds managed by CSREES constitute a powerful force in bringing about inter-state cooperation and Federal-State collaboration in the planning and conduct of agricultural research. Accordingly, the impact of Federal formula funds is far greater than would be expected solely on the basis of the amount of funds provided. Each Federal dollar appropriated for research, education, and extension leverages 4-5 state, local, and private dollars. This leveraging of resources among the partners maximizes the efficiency of the Federal investments in research and education and ensures that support from other public and private sources focuses on problems and issues important to maintaining competitiveness of U.S. agriculture in the global marketplace. In short Federal funds form the “glue” of the Federal/State partnership.

Strategic Plan

CSREES Mission

The mission of CSREES is to achieve significant and equitable improvements in domestic and global economic, environmental, and social conditions by advancing creative and integrated research, education, and extension programs in food, agricultural, and related sciences in partnership with both the public and private sectors.

CSREES Vision

CSREES is an agency providing innovative and insightful leadership to USDA partnerships for creating relevant, excellent, and useful research, education and extension programs which help people, industry, and governments solve current and emerging problems.

Functions

The functions are the operatives by which activities associated with the plan are implemented. CSREES functions are as follows:

- Originate fundamental knowledge from basic research at the frontiers of the biological, physical and social sciences
- Produce, apply, and adopt applied research-based knowledge in innovative ways to address problems and issues
- Provide developmental research and technology transfer to promote the commercialization and transfer of technologies and practices to potential users in a timely, cost-effective manner
- Provide leadership in the delivery of research-based knowledge through extension, outreach, and information dissemination to strengthen the capacity of public and private decision makers

- Strengthen the capacity of institutions of higher education to develop the skills of the Nation's workforce in the food and agricultural sciences.
- Assure quality control, review, oversight of programs supported through Federal funding
- Coordinate programs across institutions to create a national perspective and minimize duplication of effort

CSREES Values

The CSREES values distinguish the agency as a leader in providing quality research, education, and extension programs. These values include:

- **Quality and excellence.** CSREES is dedicated to maintaining rigorous standards in research, higher education, and extension.
- **Relevance.** The agency sets priorities, allocates resources, and provides service relevant to customers' needs.
- **Creativity and innovation.** CSREES encourages imaginative, original, and inventive analyses and programs.
- **Responsiveness.** The agency targets research and education resources to the changing needs of partners and customers.
- **Timeliness.** CSREES strives to deliver programs as quickly as possible.
- **Accessibility.** The agency ensures that services, programs, and resources are provided without bias or discrimination.
- **Diversity.** CSREES values and supports diversity and pluralism in the agency and in the constituents it serves.
- **Integration.** The CSREES workforce, partners, and customers demonstrate collaboration and cooperation.
- **Efficiency.** CSREES acknowledges taxpayers' stake in the agency and channels resources so as to avoid waste and redundancy.
- **Decentralization.** The agency accomplishes its goals through its university partners and the research, higher education, and extension systems by transferring knowledge, technology, and skills to customers--enabling them to set their own priorities and to make informed decisions about issues.
- **Accountability.** The agency documents program impacts and communicates program outcomes to stakeholders, partners, and customers.

The values inform the work of CSREES and provide benchmarks of quality against which to measure administrative and program performance.

CSREES Guiding Principles

CSREES, as a Federal agency, is both the catalyst and the focal point for national programs of research, higher education, and extension conducted throughout the land-grant university system and by other partners. Through CSREES, USDA fulfills responsibilities related to cooperative research, higher education, and extension as mandated by federal legislation. In carrying out these principles, CSREES:

- Provides national leadership to emphasize national program priorities; to foster collaboration; to avoid duplication of effort; and to provide access to, transfer of, and dissemination of education and research-based information targeted to customer needs.
- Participates in a system for the formulation of research, higher education, and extension policies and programs that interdependently address customer needs at the State and local levels.
- Serves as a contact point for State and local partners seeking information and guidance about legislation, funding, regulations, and other national and international concerns.
- Initiates cooperative agreements and contracts with institutions and individuals; awards grants to these partners; and performs the analysis, planning, evaluation, and coordination necessary to accomplish the agency's mission.

CSREES also provides a unified federal voice to represent the research, higher education, and extension interests of land-grant institutions in dealing with other agencies within the Federal Government.

Outcomes, Goals, and Program Objectives

CSREES is one of four agencies that comprise the REE Mission Area of USDA. The agency links USDA to the land grant university system and other research institutions and agencies enabling the achievement of joint goals and objectives. CSREES and its partners operate to effect different outputs resulting in shared outcomes. For example, the agency may design and implement a new grants program leading to increased technology transfer efforts resulting in new businesses and jobs in rural areas. The CSREES Agency Strategic Plan is linked to five broad societal goals or outcomes approved for the Mission Area. The goals form the framework from which the agency will launch procedural and program strategies which, in combination with system program action and implementation will lead to joint accomplishments reported in the plan. While the goals have been accepted as the basis for developing accountability measures under GPRA, it is important to note that these goals offer challenges in linking CSREES as the Federal agency with those eligible institutions and organizations who perform the work. While goals are in some instances measurable, the research and extension efforts provide unique challenges because many of the outcome measures are difficult to quantify in advance. Despite this concern, significant in this statement is the fact that there is an equal commitment on part of

the agency and its partners to respond to the challenges of GPRA by providing outputs that can be aggregated at the national level to measure the success of research and extension activities.

Goals

In the CSREES Strategic Plan, the goals adopted by the Research, Education and Economics Mission Agency have been used as goals from which to launch the strategic plan and identify measures in response to accountability.

- **An agricultural production system that is highly competitive in the global economy.**
- **A safe, secure food and fiber system.**
- **Healthy, well-nourished population.**
- **Greater harmony between agriculture and the environment.**
- **Enhanced economic opportunity and quality of life for Americans.**

The sections that follow provide illustrations on how the plan will be used to implement research, extension, and higher education programs important to the CSREES Mission through actions of the Federal partner and the broad agricultural knowledge system.

REE Goal 1. An agricultural production system that is highly competitive in the global economy.

CSREES Objective 1.1: To produce new and value-added agricultural products and commodities.

Outputs

- To annually increase the research and knowledge-base available from CSREES partners and cooperators on new and value-added commodities and products in U.S. agriculture.
- To annually increase agricultural producer awareness, understanding, and information regarding the production of new and value-added commodities and products in U.S. agriculture in which CSREES partners and cooperators play an active research, education, or extension role.

Outcomes

- To annually increase the total number of new and value-added U.S. agricultural commodities and products introduced into domestic and foreign markets in cooperation with CSREES partners and cooperators.
- To annually increase the total dollar value of new and value-added U.S. agricultural commodities and products introduced into foreign markets.

CSREES Objective 1.2: To increase the global competitiveness of the U.S. agricultural production system.

Outputs

- To annually increase the research and knowledge-base available from CSREES partners and cooperators on improving the productivity and global competitiveness of the U.S. agricultural production system.
- To annually increase agricultural producer awareness, understanding, and information on improving the productivity and global competitiveness of the U.S. agricultural production system in which CSREES partners and cooperators play an active research, education, or extension role.

Outcomes

- To increase the productive efficiency of the U.S. agricultural production system.

CSREES Objective 1.3: To recruit and educate a diverse set of individuals for careers as future scientists, professionals, and leaders who are well-trained in agricultural sciences.

Outcomes

- To strengthen the capacity of higher education institutions to develop future scientists, professionals, and leaders in agricultural production sciences and related disciplines who will more effectively contribute to the productivity and global competitiveness of the U.S. agricultural production system.
- To meet the annual demand in the market for individuals formally educated and trained at institutions of higher education as scientists, professionals, and leaders in agricultural production sciences and related disciplines.

CSREES Objective 1.4: To improve decision-making on public policy issues related to the productivity and global competitiveness of the U.S. agricultural production system.

Outputs

- To annually increase the research and knowledge-base available from CSREES partners and cooperators on public policy issues affecting the productivity and global competitiveness of the U.S. agricultural production system.

Outcomes

- To annually increase the effectiveness of constituent and citizen participation on public policy issues affecting the productivity and global competitiveness of the U.S. agricultural production system.

REE Goal 2. A safe, secure food and fiber system

CSREES Objective 2.1: To improve access to an affordable, healthful, and culturally relevant food supply.

Outputs

- To annually increase the research and know-ledge-base available from CSREES partners and cooperators on food accessibility and affordability.
- To annually increase consumer awareness, understanding, and information on food accessibility and affordability in which CSREES partners and cooperators play an active research, education, or extension role.

Outcomes

- To annually increase consumer awareness, understanding, and information on food accessibility and affordability in which CSREES partners and cooperators play an active research, education, or extension role.
- To annually increase the effectiveness of constituent and citizen participation on public policy issues affecting food security (i.e., food access, affordability, and recovery).

CSREES Objective 2.2: To improve food safety by controlling or eliminating food borne risks.

Outputs

- To annually increase the research and knowledge-base available from CSREES partners and cooperators on food safety and food borne risks and illnesses.

Outcomes

- To annually increase consumer awareness, understanding, and information regarding food safety and food borne risks and illnesses in which CSREES partners and cooperators play an active research, education, or extension role.
- To strengthen the capacity of higher education institutions to develop future scientists, professionals, and leaders in food sciences who will more effectively contribute to a greater under-standing of food safety, including food borne risks and illnesses.

REE Goal 3. A Healthy, well nourished population.

CSREES Objective 3.1: To optimize the health of consumers by improving the quality of diets, the quality of food, and the number of food choices.

Outputs

- To annually increase the research and knowledge-base available from CSREES partners and cooperators on human nutrition, and family and consumer sciences

Outcomes

- To annually reduce health risk factors through non-formal educational programs to improve dietary habits and physical exercise practices in which CSREES partners and cooperators play an active research, education, or extension role.

- To annually increase consumer awareness, understanding, and information on dietary guidance and appropriate nutrition practices in which CSREES partners and cooperators play an active research, education, or extension role.
- To strengthen the capacity of higher education institutions to develop future scientists, professionals, and leaders in human nutrition, and family and consumer sciences who will more effectively contribute to understanding issues related to human nutrition, and family and consumer sciences.
- To meet the annual demand in the market for individuals formally educated and trained at institutions of higher education as scientists, professionals, and leaders in human nutrition, and family and consumer sciences and related disciplines.

CSREES Objective 3.2: To promote health, safety, and access to quality health care.

Outputs

- To annually increase the research and knowledge-base made available by CSREES partners and cooperators on health sciences and health promotion.

Outcomes

- To annually improve individual and family health status through non-formal health education and promotion programs in which CSREES partners and cooperators play an active research, education, or extension role.
- To annually improve the level of individual and family safety (or reduce risk levels) from accidents in homes, schools, workplaces, and communities.
- To strengthen the capacity of higher education institutions to develop future scientists, professionals, and leaders in health sciences who will more effectively contribute to understanding issues related to health sciences and related disciplines.
- To meet the annual demand in the market for individuals formally educated and trained at institutions of higher education as scientists, professionals, and leaders in health sciences and related disciplines.
- To annually increase the availability of health education programs to communities in which CSREES partners and cooperators play an active research, education, or extension role.
- To annually increase the effectiveness of constituent and citizen participation on public policy issues affecting health community decision-making.

REE Goal 4. Greater harmony between agriculture and the environment

CSREES Objective 4.1: To develop, transfer, and promote the adoption of efficient and sustainable agricultural, forestry, and other resource conservation policies, programs, technologies, and practices that ensure ecosystems integrity and biodiversity.

Outputs

- To annually increase the research and knowledge-base available from CSREES partners and cooperators on environmental sciences and agriculture, including conserving, maintaining, and protecting ecosystem integrity and biodiversity.

Outcomes

- To annually ensure ecosystems integrity and biodiversity.
- To annually increase agricultural producer awareness, understanding, and information regarding the adoption of agricultural production practices that sustain and/or protect ecosystem integrity and biodiversity in which CSREES partners and cooperators play an active research, education, and extension role.
- To strengthen the capacity of higher education institutions to develop future scientists, professionals, and leaders in environmental sciences and related disciplines who will more effectively contribute to the development of agricultural production practices that sustain and/or protect ecosystems and bring into greater balance agricultural production activities and biodiversity needs of the surrounding ecosystem.
- To meet the annual demand in the market for individuals formally educated and trained as scientists, professionals, and leaders in environmental sciences and related disciplines.

CSREES Objective 4.2: To develop, transfer, and promote adoption of efficient and sustainable agricultural, forestry, and other resource policies, programs, technologies, and practices that protect, sustain, and enhance water, soil and air resources.

Outcomes

- To annually increase producer adoption of agricultural production practices that conserve and/or protect surface and groundwater supplies on or adjacent to agricultural production sites or land uses.
- To annually increase producer adoption of agricultural production “best practices” that conserve, protect, and/or enhance the soil resources on or adjacent to agricultural production sites or land uses.

CSREES Objective 4.3: To improve decision-making on public policies related to agriculture and the environment.

Outputs

- To annually increase the research and knowledge-base available from CSREES partners and cooperators on public policy issues affecting agricultural production, the environment, and ecosystem integrity and biodiversity.

Outcomes

- To annually increase the effectiveness of constituent and citizen participation on public policy issues affecting agricultural production, the environment, and ecosystem integrity and biodiversity.

REE Goal 5. Enhanced economic opportunity and quality of life for Americans

CSREES Objective 5.1: To increase the capacity of communities and families to enhance their own economic well-being.

Outputs

- To annually increase the research and knowledge-base available from CSREES partners and cooperators on the economic well-being of communities and their citizens.

Outcomes

- To annually increase economic opportunities in communities through economic development programs in which CSREES partners and cooperators play an active research, education, and extension role.
- To annually improve the financial status of families through financial management education programs implemented in which CSREES partners and cooperators play an active research, education, or extension role.
- To strengthen the capacity of higher education institutions to develop future scientists, professionals, and leaders in family, consumer, and community economics who will more effectively contribute to greater understanding of economic issues.
- To meet the annual demand in the market for individuals formally educated and trained at institutions of higher education as scientists, professionals, and leaders in family, consumer, and community economics and related disciplines.

CSREES Objective 5.2: To increase the capacity of communities, families, and individuals to improve their own quality of life.

Outcomes

- To annually increase the incidence of caring communities resulting from non-formal education programs in which CSREES partners and cooperators play an active research, education, or extension role.
- To annually increase the incidence of strong families resulting from non-formal education programs in which CSREES partners and cooperators play an active research, education, or extension role.

Managerial Initiatives

The benefits of university-based agricultural research, education, and extension programs are derived not only from Federal financial support coupled with the management, scientific, and programmatic efforts of state and county professional and support staff, but also from the program management, direction, and oversight provided by Federal staff. CSREES will take the following strategic actions to steer the direction and assure the quality of Federal investment in the decentralized, university-based, agricultural knowledge system.

Management Initiative A: Designing and implementing new programs and funding mechanisms to facilitate the transition in American agriculture to a world market base

International trade agreements such as the GATT and NAFTA, the 1996 FAIR Act, improvements in international communications and finance, and the emergence of new agricultural markets and suppliers are working in concert to fully integrate U.S. agriculture into world markets and away from decisions based on the commodity programs. To succeed in this environment, producers and the communities in which they live need the benefits of agricultural science and education to provide a comparative advantage.

Output:

Operating rules and protocols for the Fund for Rural America

Jointly developed (with the National Research Education, Extension, and Education Advisory Board) program description and request for proposals for the Fund for Rural America

Outcomes:

Active, interdisciplinary, interfunctional projects to transfer technology from agricultural laboratories to producers, processors, distributors, and consumers.

Long-term economic growth, and sustained well-being of rural communities.

Management Initiative B: Linking university, private, and Federal scientific and programmatic expertise for the purposes of planning innovative and cost effective programs.

The long-term cooperative relationship between land-grant universities, Federal laboratories, and other research and educational institutions with the Cooperative State Research, Education, and Extension Service, and new legislation in the FAIR Act of 1996, provide a unique opportunity to jointly plan and deliver programs. CSREES can benefit from flexible staffing, partners can engage in faculty and staff development opportunities, and the agricultural knowledge system will be directed by the joint decisions and involvement of users, providers, and administrators of agency programs.

Output:

Problem solving task forces formed within CSREES and between CSREES and its partners and other Federal agencies, public, and private organizations to address high priority problems

Increased use of IPA shared faculty, and term appointment opportunities for university and Federal laboratory scientists and educators

Outcomes:

Collective knowledge of system and agency priorities and capacity

Cost-effective staffing across a wide range of disciplines and skills

Rapid response to critical issues through innovative program design and delivery

Management Initiative C: Brokering the capacity of agricultural scientists and educators to address critical public issues in related fields

The boundaries of agricultural science and education are expanding as the expertise of university-based professionals in the field widens and deepens. CSREES can help utilize the capacity in agriculture to address current and emerging issues related to the environment, economic development, materials science, human health and related areas by linking to the missions of Federal and private programs in these fields. The agency has broad authority to manage research and education funds to the land grant universities and other eligible institutions, enter memoranda of understanding, and conduct planning and coordination activities to leverage resources to respond in a unified, effective way to critical issues.

Output:

Joint plans across programs to address critical issues

Increased resources to land grant universities to support research and education

Outcomes:

Innovative, cost-effective solutions to public problems such as environmental degradation, public health, rural development, integrated pest management, water quality, and food safety.

Management Initiative D: Continuous Review of Programs, Projects, and Processes

The agency will expand the research review process to comprehensive program reviews, addressing formula, competitive and noncompetitive research, extension, education, and buildings and facilities grants, within a university department, program or laboratory. It also will establish a program management protocol review process for internal assessment of program objectives and implementation procedures for each major special grant, Smith-Lever 3(d) program, and other authorized, funded programs. In addition, CSREES will develop new post-award management procedures to assure oversight of the agencies 6,000 active awards.

Outputs:

Expert guidance to university program administrators, scientists, and educators developed by teams of subject matter peers

Annual management plans for each major program administered by the agency

Established, codified procedures to guide programmatic, financial, and technical oversight of grants and awards

Outcomes:

Non-duplicative research and education programs which meet high standards for scientific merit, relevance to important issues, and usefulness in solving state, regional, and national problems

Focused Federal expenditures to best use; responsive programs across programs or within institutions

Redirection of resources to respond to emerging issues of national importance

Management Initiative E: Improved management information systems

Currently the agency supports the Current Research Information System (CRIS), grants tracking software, and Extension plans of work. These systems need to be updated and consolidated or coordinated to expedite response to questions about agency programs, provide data useful in assessing program outcomes, and facilitate information sharing within the agricultural knowledge system.

Make informed decisions on future programs

Assess program impacts

Output:

Up-to-date management information system(s)

Outcomes:

Research based guidance available to producers, processors, traders, policy makers, consumers, educators and other interested in agriculture

Current information about trends, issues, projects and programs in agricultural research, education, and extension leading to timely response to inquiries, rapid resolution of problems, and reduction in duplication of effort

Public accountability for program expenditures

The agency, in collaboration with Federal and university partners, will review and improve information management systems, and collaborate to develop short and long-term performance measures.

Annual Performance Plan

While the plan outlines broad outcomes and outputs, a link to measures will take place as the framework of the strategic plan is linked to a performance plan. The performance plan is being developed through an iterative process that will give guidance in developing annual and five year responses. During the Month of April 1997, four regional orientation sessions will be held to develop acceptance for the strategic planning framework and activities that will generate outcome measures. Between July 1 and September 15, 1997, CSREES will work with university research and education partners to set State level performance targets and establish baseline values for the targets. The State plans will be reviewed by CSREES senior staff and, upon approval, combined into a national performance framework for CSREES and its partners, thereby establishing a link between the agency and partners for measures that are responsive to the accountability mandate of GPRA.

Budget

In establishing a budget base for the plan, the FY 1996 agency budget will be used. The budget presents the correspondence between REE outcomes and the functional areas in which programs are implemented (Basic Research; Applied Research; Extension, Outreach and Information Dissemination; and Higher Education).

	Basic Research	Applied Research	Extension, Outreach, and Information Dissemination	Higher Education	Developmental Research & Technology Transfer
Competitive agricultural system in the global economy	58.8	59.8	67.9	6.6	4.6
Safe, secure food and fiber system	52.3	53.2	64.0	3.5	4.1
Healthy, well-nourished population	11.3	11.5	156.0 ^b	3.5	0.9
Agriculture interface with the environment	35.8	36.1	54.1	3.5	2.8
Economic development and quality of life	34.9	35.3	86.0 ^c	3.3	2.7
Total by Function	193.1	195.9	428.0	20.4	15.1 ^a

^a Does not include \$14.8 million in special grants.

^b Includes Smith Lever 3D (EFNEP, Youth at Risk, Farm Safety).

^c Includes Ag Communications, Rural Health/Safety, Extension Specialist (AR), Rural Center for the Study/Promotion of HIV/STD Prevention (IN), and Delta Teachers Academy.

Appendixes

Appendix A: Glossary of Terms

Customers: Individuals or organizations that directly use CSREES products and services.

Stakeholders: Organizations or individuals that have an interest in the work of CSREES, but may or may not directly use the agency's products.

Partners: Organizations that CSREES works with collaboratively.

CHAPTER IV

Economic Research Service (ERS)

INFORMATION RESOURCES MANAGEMENT PLAN, 1998-2002

1. Introduction

a. Agency.

The Economic Research Service (ERS) was established in 1961 principally under the authority of the Agricultural Marketing Act of 1946. ERS is preparing for a relocation to 1800 M St., N.W., in October 1997. An agency realignment is being planned to coincide with the move and to position the agency to implement its goals and objectives.

The appropriation for Economic Analysis and Research is authorized by the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 1996 (Public Law 104-37). The mission of the Agency is to provide economic and other social science information and analysis for public and private decisions on agriculture, food, natural resources, and rural development.

The general goals and objectives of ERS as presented in the draft strategic plan dated May 1997 are:

GENERAL GOAL 1. The agricultural production system is highly competitive in the global economy.

Objective 1.1. ERS analysis helps the U.S. food and agriculture sector identify effective adaptations to changing market structure, domestic policy reforms, and post-GATT and post-NAFTA trade conditions.

GENERAL GOAL 2. The food production system is safe and secure.

Objective 2.1. ERS analysis improves the efficiency, efficacy, and equity of public policies and programs designed to protect consumers from unsafe food.

GENERAL GOAL 3. The nation's population is healthy and well-nourished.

Objective 3.1. ERS analysis helps identify efficient and effective public policies whose adoption would ensure consumers equitable access to wider varieties of high-quality foods at affordable prices.

Objective 3.2. ERS analysis of the food sector and retail food prices improves public and private decision making and understanding of structural change.

GENERAL GOAL 4. Agriculture and the environment are in harmony

Objective 4.1. ERS analysis helps develop Federal farm, natural resource, and economic development policies and programs that balance long term sustainability goals with improved agricultural competitiveness and economic growth.

GENERAL GOAL 5. Enhanced economic opportunity and quality of life for rural Americans.

Objective 5.1. ERS analysis helps identify how investments in rural people, businesses, and communities affect rural economies' capacity to survive and prosper in the global marketplace. Provide analyses on the changing size and characteristics of the rural population and the implications of these changes on rural economies, including skill development in the resident labor force.

Objective 5.2. ERS analysis underpins development of policies that keep American farms viable.

Activities to support these goals in FY 1999 involve research, situation and outlook analysis, and development of economic and statistical indicators on a broad range of topics including, but not limited to global marketing conditions, trade restrictions, agribusiness concentration, farm and retail food prices, food borne illnesses, food labeling, nutrition, worker safety, agrichemical usage, livestock wastes management, conservation, sustainability, genetic diversity, technology transfer, biofuels, rural infrastructure, and agricultural labor. In FY 1999, research results, outlook analysis, and indicators on such important agricultural, food, natural resource, and rural issues will be fully disseminated to public and private decision makers through hundreds of published and electronic reports and articles; special staff analyses, briefings, presentations, and papers; data bases; and individual contacts. Through such activities ERS provides public and private decision makers with economic and other social science information and analysis that helps them attain the goals that promote agricultural competitiveness, food safety and security, a well nourished population, environmental quality, and a sustainable rural economy.

Work performed for others, mostly USDA agencies, is in support of the ERS mission and goals and involves analysis of the costs and benefits of alternative programs, policies, rules, and regulations.

b. Agency IRM Program.

ERS' IRM program is shaped by the Information Services Coordinating Committee (ISCC), the Board of Directors for ERS' Information Services Division (ISD). The ISCC is chaired by the ERS Associate Administrator and has representation from all ERS program areas. The ISCC reviews all ISD activities; develops, via subcommittees, policies for the standardization of software and hardware; and recommends initiatives for approval by agency management. The key customers of the IRM program are the ERS program divisions and the main goal is the

effective utilization of technology to improve the analysis and delivery of information to agency customers.

2. IRM Planning Process.

The agency IRM planning is guided by the ISCC. Major initiatives are presented to the ISCC for appropriate review and action. Particular items are assigned to subcommittees for investigation and development of options and recommendations for action. Items approved by the ISCC are then reviewed by the Agency IRM Committee composed of the Administrator, Associate Administrator, and Division Directors.

The Agency participates with the other agencies reporting to the Under Secretary for Research, Education and Economics in the REE Communications and Technology Coordinating Council. The Council addresses issues of mutual concern and when needed coordinates resources, projects, and communications between and among the four agencies supporting the REE mission area.

3. Current IRM Environment.

Many system architectures can provide the computing environment needed to accomplish ERS' mission. The architecture below is based on the existing ERS architecture, but with the view that technological evolution, especially in communications and operating systems, will soon result in an effective merger of this architecture with emerging government standards.

Hardware. The long-term configuration of ERS' Local Area Network (LAN) is based on integration of multiple computing platforms available to ERS staff. These platforms are in four general categories: mainframes, mid-range ERS systems, workgroup systems, and desktop computers.

Mainframe computing available to users include the very large computer systems available through the National Information Technology Center (Kansas City), the National Finance Center (New Orleans), private service providers, and other sources of information and data needed by ERS users. The primary function of these centers is to provide access to databases and other information resources shared across the Department.

The mid-range ERS system supports the internal integration of work group servers, desktop computers, and external resources. Its primary function is the operation and control of ERS' LAN interconnections with external systems. Additional resources will be available for temporary staging of data and the execution of functions not available on the workgroup systems. This function is being replaced with LAN server technologies and Internet-based communications.

A workgroup system, with its associated servers and communications, is a logical association of the local computing power of the workgroup. That is, it is a physical segment of ERS' LAN but provides primary support to the workgroup. Workgroups use network servers to share resources

among the desktop systems of the workgroup. The servers also provide storage and access for data resources "owned" by the workgroup. The shared resources, in addition to databases, include printers, modems, faxes, backup devices, and software.

Desktop computers provide each ERS staff member with the computing power needed to perform assigned tasks. A desktop system configured as a standard workstation includes hardware, software, and communications components needed to access and use ERS' LAN and the resources available through it, including information, data, and software. The standard workstation evolves as necessary to keep pace with technological changes. Each employee has access to the software that is needed to perform assigned tasks. This can be located on any of the platforms and will range from word processing and spreadsheets to database and analytical packages.

Communications. The standard network topology is the token ring. ERS' LAN is composed of five rings connected by bridges. Each ERS division is attached to a physical ring and defined as a domain on that ring. Each ring has access to the other rings through a bridge. The domain defines the resources available to the division. A gateway for each ring provides access to ERS's central computing services. Desktop workstations have access to services throughout ERS' LAN, to all of its centralized services, and to external computing facilities.

Software. The individual employee's workstation provides the entry point to all of the services on ERS' LAN. As such, it is the dominant element of the system. All software that is developed or procured for the system incorporates the same look and feel. All workstation software and interfaces to other platforms are based on a graphical user interface (GUI) standard, which defines how the user interface looks and works across platforms. Using this standard, all software uses the same features (action bars, pull-downs, icons) and follows the same object representations. The intent is to develop user-friendly front-ends to services that are similar across all applications.

ERS' LAN uses client-server technology. Under this concept, processing is distributed throughout a network of intelligent devices. Processing can be accomplished at the workstation or at the server. The server can be any of the platforms in the system depending on the processing power needed. The intention is to provide access to information from one or more locations that can be brought back to the workstation for manipulation.

The client-server implementation relies on the use of a relational database management system (RDBMS) and structured query language (SQL). The RDBMS stores information as tables of rows and columns and includes tools to access data in one or more related tables based on user-supplied criteria. An RDBMS, wherever it is physically stored, is the logical server in the client-server architecture. Client applications on desktop workstations communicate with the RDBMS through SQL, a data manipulation language. SQL is a standard that is incorporated in many software packages including spreadsheets and word processors, as well as the RDBMS. Under the RDBMS and SQL implementation concept, a data query from a single client can be

distributed to the various servers storing the requested data and the resulting information will be returned to the client application.

4. Accomplishments.

ISD serves primarily as a facilitator and enabler to the agency staff. The division has completed the networking of the agency, establishment of standards in the software and hardware arena, developed electronic methods to produce publications, introduced electronic forms of output distribution, and developed databases and analytical routines for program division staff to complete their tasks.

The agency makes improvements in an evolutionary manner. Each step is designed to improve access to data; improve internal and external communications through electronic media; provide a high level of confidence in the analytical tools available for staff use and therefore in the final output; improve outreach to customers through enhanced printed and electronic products; and to improve integration of special program needs in the design of the overall IRM architecture.

Accomplishments over the past year include:

- Formalized operation and support of the ERS home page.
- Developed and implemented the ERS internal Web Site (Intranet).
- Integrated ERS e-mail system with the USDA WorldTalk system.
- Evaluated 32-bit desktop operating systems and standardized on NT.
- Completed network design for ERS's new location.
- Implemented CISCO router as the interface to the USDA network as recommended by the Department.
- Developed plans for year 2000 conversion, and completed inventory of affected systems.
- Developed plans for agency move to 1800 M St. N.W.
- Designed and implemented a publications tracking database to improve publishing performance.
- Expanded CD ROM based resources available through the agency LAN.
- Provided team training for all Information Systems Division staff.
- Developed plans for removal of the ERS host system.
- Developed LAN based solutions for local applications and improved Internet-based access to remote sites, including NITC and NFC.

5. Future Directions.

This section focuses on a vision of what ERS's IRM environment should look like to provide a framework for decision making on actions to achieve that vision, including: hardware, software, and communications procurement; systems and applications development; integration of computing technologies with program functions; and management of computing services and support in ERS.

The vision of the future outlined here is based on a current assessment of user needs and of known and anticipated technological options available to meet those needs over the five-year

planning horizon. Frequent assessments are needed to adapt the plan to changing needs and technological developments, add capabilities to the basic framework, and sharpen its focus.

While this IRM plan envisions continued delivery of information, data, knowledge, and powerful tools to every desktop in ERS, it does not address specific applications. Rather, it assumes that specific application needs will be addressed with systems that extend and complement the basic capabilities available ERS-wide. The plan assumes that all staff members should be able to use every available capability needed to perform their jobs. This means that ERS stands ready to provide the needed capabilities at the users' desktops, including hardware, software, communications, training, and support.

This vision of the ERS electronic workplace assumes that ERS programs will continue to evolve in response to changing customer needs and resource availabilities. It also assumes that program redirection will not change substantially the tasks needed to accomplish program objectives. These tasks include information and data collection and assembly, research and analysis, and development, publication, and dissemination of economic and other social science information.

The heart of the electronic workplace is a personal desktop computer. This computer is the personal tool of each staff member, it is also an integral part of a total computing environment that enables each employee to use advanced technologies for the efficient, effective, and timely delivery of information. Through the desktop computer and its connection through ERS' LAN, with access to external resources, each staff member has access to and use of the following interrelated components:

- a communications network linking ERS users to each other, other USDA agencies, external providers of information and data, users of ERS's information and data products and services, and colleagues around the Nation and world;
- a series of databases for information, data, and metadata used to support ERS's program functions;
- a suite of state-of-the-art scientific and analytical software for economic and social science computation, research, and analysis;
- an integrated system for the production and dissemination of ERS publications and electronic information and data products and services; and
- office management, personal information, and workgroup productivity tools to help users navigate the electronic workplace and maximize its potential benefits and efficiencies.
- an Intranet providing access to current Agency information, calendar of events, training bulletins, and data.

Each part of this total environment is described below in terms of both its role in the overall system and the user services delivered with it.

Communications. ERS' network serves, first and foremost, to connect all ERS desktop computers to each other and to other ERS computing platforms. On ERS' LAN, staff communicate with each other through electronic mail, transfer data and documents, use groupware (where two or more individuals work simultaneously on the same task), and use automated workflow systems (where documents/files are forwarded automatically to the next person along a chain of those who need to have/use them).

ERS' LAN is also the gateway through which ERS staff gain access to other networks. Imbedded in the LAN is the routing information needed to connect to other USDA networks, the Internet, and to external data sources and users. The technical knowledge required to access these networks is built in so users can make simple menu choices to send a message or a file to a university colleague via the Internet, connect to other USDA agencies, or send a copy of a document to a fax machine at a distant location using a public network.

Databases. ERS has a distributed environment for the organization and management of information and data. Databases, including databases of metadata, tables, text, graphics, images, and documents reside with their logical owners on desktop systems or workgroup servers. Research data are located with users to serve individual needs. Information and data of a permanent nature are stored and managed on database servers for shared access by all users.

Users at their desktop computers are linked to the LAN for access to metadata resources, including the Reference Center catalog, CD-ROM literature indexes like Agricola; information resources in the form of electronic reports and journals, bulletins, and administrative announcements; data resources residing on database servers throughout ERS; and models, graphics, knowledge bases, and similar materials.

Research and Analysis. ERS staff use a broad array of analytical tools to deliver ERS programs. ERS supports selected software packages to meet generic processing needs such as spreadsheets, database management systems, graphics, statistical processing, and word processing. Interfaces for these packages provide interoperability and consistent operation across the system.

Software changes include:

- Graphical user interface (GUI) technology to provide a consistent and intuitive point-and-click interface on the desktop computer.
- Broad standardization and close integration of software through object linking and dynamic data exchange between packages are routine (e.g., changing the data in a spreadsheet or database automatically updates a table in a report or a related graphic).

- Database access also uses a graphic interface and takes advantage of client-server technology. Complex database functions are performed transparently on a relational database package (the server) through interaction with a familiar front-end package such as Lotus 1-2-3 (the client).

Software is user friendly, allowing less-advanced users full access to advanced features. Gains in productivity are realized in all areas of work, but especially in data management and analysis.

Expert systems, neural networks, and other knowledge-based software tools enhance the decision making and modeling efforts in ERS. In parallel with these systems, the client-server approach to database implementation permits efficient use of powerful microcomputer database management systems to organize, sort, and use data. This approach also affords users of small databases access to the power of software formerly reserved for large databases.

ERS analysts routinely switch from one software package to another using multi-tasking technology. Cutting and pasting between programs (mostly among database, spreadsheet, graphics, statistical, and word processing packages) and interprogram file linking (e.g., databases linked to graphics or statistical packages) are routine.

Users of the supported packages have access to databases as noted above and into publication processing software. Users also have access to and support for state-of-the-art modeling and analytical software for research.

Information and Data Products and Services. ERS staff prepare and present briefings, conference papers, and similar materials almost daily. These activities are supported by use of modern multimedia tools such as color printers, slide-making systems, video tape editing and production systems, and PC based dynamic presentation systems. Authors, editors, and designers work simultaneously on reports, and these reports are linked into systems for electronic dissemination, including dissemination on CD-ROM. Similarly, integrated systems link database developers to electronic data products, bulletin boards, and other dissemination systems.

An integrated system linking information and data production to information and data dissemination in all its forms is used for effective, efficient, and timely delivery of ERS products and services. A group of authors, reviewers, editors, and designers linked through ERS' LAN is the cornerstone of the ERS publication process. Those involved in the publication process can communicate instantly with each other over the network via a groupware arrangement. This means that everyone involved has immediate and simultaneous access to the draft manuscript to aid planning and tracking.

Authors compose draft manuscripts directly on their workstations, prepare electronic graphics, and link these directly into their draft manuscripts. All software packages are linked dynamically. This means a change in any facet of the manuscript draft will automatically be made in all the

linked software. For example, a number that is changed in a spreadsheet or database is automatically changed in any related charts and text.

All clearances (branch, division, agency, REE, and Departmental) are done electronically. Several reviewers can electronically review the manuscript simultaneously. They can electronically embed their notes and comments into the draft. The author can view the notes and comments from all reviewers at the same time and respond to each as appropriate.

Authors let editors know when the draft manuscript is ready for review. The editor's work is done entirely on screen. Large computer monitors display several pages side by side. This feature allows editors to view, read, and work on many pages simultaneously. Discussions with authors are in person, by voice notes, or by E-mail through the network. Technology eliminates the need for passing paper back and forth between editor and author. Authors view editorial changes electronically. Acceptance of editorial advice and revision is completed by simple keystrokes.

Camera-copy production is a continuous, cooperative process involving the author and editor. At each stage, as a revision or refinement is accepted electronically, it automatically becomes a part of the final document. Once all the elements of a draft have been reviewed and finalized, actual output takes a variety of formats:

Electronic copy: Published reports are delivered to users via the ERS LAN's link to the Internet. Most periodical subscriptions are delivered this way.

Paper copy. A regular print run produces paper copies for customers who cannot receive their copies electronically. When stock from the regular press run is exhausted, ERS can also print on demand (i.e., produce a paper copy by specific request). The publication demanded is printed in its original colors so that there is virtually no difference in appearance between the single copy and the regular print run.

Archive copies. A report is automatically stored in the publications database for retrieval by ERS researchers from their desktops. It is also stored on optical media, such as CD-ROM, where it is permanently archived and instantly retrievable. Publications CD-ROMs are issued routinely for public use.

Personal and Workgroup Productivity. Electronic calendaring, message routing, document sharing, and other time management services are provided through the ERS LAN. Every employee has access to standard features and optional personal tools to navigate the electronic office. Electronic mail, fax, and voice mail services are commonplace, including electronic mail to and from research colleagues around the country and the world. Within workgroups, innovative groupware systems support collaborative work on research projects, staff analyses, and situation and outlook activities. An Intranet provides electronic access to administrative information, calendar of events, agency activities and announcements, policy and procedures as well as shared databases.

IV. Objectives

1.1. Objective Title: Network Computer Systems

1.2. Status: Ongoing.

1.3. Objective Statement: To provide each employee of ERS with a microcomputer workstation linked to agency wide office systems and data processing resources to aid in data and document sharing and transfer as well as to external networks such as the Internet.

1.4. Strategy: Token ring backbone cabling is installed throughout ERS. This provides the ability to attach microcomputers to ERS' LAN. Five workgroup domains are defined on the rings that comprise ERS' LAN. The domains are installed in a serial fashion, and new applications are developed as needed. Typical configurations require multiple servers, based on large microcomputers, supporting 75-200 workstations. Through the LAN, each workstation also has access to ERS's central processor, external computing resources at NITC, as well as other workstations throughout ERS.

While all employees are connected to the LAN, the agency must now relocate to 1800 M St., N.W. Steps must be taken to review LAN performance, make improvements where possible and provide for a smooth transition to the new site.

1.5. Programs Supported: Networking supports all program areas. Microcomputers serve as an integral part of the agency information processing system. To maximize efficiency, each workstation has access to any resource needed. Connectivity to all levels of computing services allows the analyst to use the most efficient and effective methodology available.

1.6. Cross-Cutting or Interagency Programs Supported: Not Applicable.

1.7. Background: Connectivity to each workstation in ERS has been moving slowly over the last several years. However, all employees now have access to the LAN and all resources it contains. Gateways provide external linkages through the USDA network.

1.8. Contact Name and Phone Number: A. Michael Ahrens—202-219-0761.

1.9. Major Milestones:

	Planned		Actual
	Start Date	End Date	End Date
a. Develop network architecture	1/86	3/87	3/87
b. Test token ring network	1/87	4/88	3/88
c. Install token ring backbone	4/89	2/90	2/90
d. Upgrade microcomputers for network attachment/ performance	1/91	12/96	10/96
e. Install domain microcomputers	2/91	1/95	6/95
f. Gather requirements for external networks	2/91	1/92	6/92
g. Implement access methodologies to selected external network services	2/92	4/92	6/92
h. Gather requirements for interconnection to other USDA agencies	4/93	4/94	3/94
i. Prepare for relocation to 1800 M St.	1/97	10/97	

1.10. Resources:

	THRU							Total
	FY97	FY98	FY99	FY00	FY01	FY02	FY03+	
Total Cost (\$000)	2,700	100	0	0	0	0	0	2,800
Staff-Years	18	1	0	0	0	0	0	19

1.11. Acquisition Description: None.

1.12. Departmental IRM Framework: This objective is aligned with the USDA IRM Technical Architecture. It utilizes USDA resources for access to NITC, NFC and the INTERNET.

2.1. Objective Title: Distributed Database Management System

2.2. Status: Ongoing.

2.3. Objective Statement: To optimize the use of data, it is necessary to accommodate their storage at any of the available computing platforms. The available platforms are the large departmental centers, super-microcomputer servers on ERS' LAN, and individual workstations. The goal is to locate data where they can be most efficiently accessed and analyzed.

2.4. Strategy: The employee workstation is the key component of the agency's information processing system. The power to complete a task is to be placed where it can most effectively be used. Each of the four computing platforms becomes a target for the storage and processing of data.

The first application of this distributed approach is the ERS-wide directory of information. The directory contains no actual data, but documents data holdings throughout the agency and directs users to the appropriate source. The design places the directory system on a LAN server. The server is available to each workstation on ERS' LAN. The workstation assumes the client role and receives requested documentation from the server. Expectations are that the network can support the traffic and that the server can meet expected processing cycles. Performance will be evaluated and, if problems exist, alternate platforms will be used for future operations.

The performance statistics gathered from the directory project provide needed input into the analysis and design of other database projects. Other pilot databases will be implemented on workstations, workgroup servers, division servers, and possibly an ERS-wide server. Regardless of location, all systems will be based on the client-server methodology and will incorporate a standard graphical user interface and structured query language for access. Intranet Technology will be factored into this arena and it's impact will be assessed.

2.5. Programs Supported: This is an integral part of ERS's IRM design and is supportive of all ERS programs.

2.6. Cross-Cutting or Interagency Program Supported: All new applications will be designed following the distributed, client-server strategy. As such, this is supportive of each initiative.

2.7. Background: ERS' Information Services Coordinating Committee (ISCC) has designed ERS's information processing system on the networked workstation concept using a distributed client-server technology. This is based on the need to place information and processing power as close to the employee as possible. However, the placement of the server will depend on other variables such as the size of the database, volatility of the data, security issues, and number of users needing access.

2.8. Contact Name and Phone Number: A. Michael Ahrens—202-219-0761.

2.9. Major Milestones:

	Planned		Actual
	Start Date	End Date	End Date
a. Install agency wide information directory on the LAN	2/91	1/92	2/92
b. Provide automated search feature for directory	1/93	6/93	12/93
c. Install pilot server-level database on the LAN	4/91	3/92	3/92
d. Develop requirements for user interfaces to pilot server databases	2/92	1/93	1/93
e. Demo user interfaces to server databases	3/92	2/93	4/93
f. Prepare proposed standards for server-level databases and user interfaces	3/93	8/93	12/93
g. Formalize standards	4/93	12/93	1/94
h. Develop active directory capability to navigate distributed databases. Study impact of INTRANET on distributed databases.	3/93	12/98	
I. Develop GUI-based applications to relational tables pilot with Specialty Agriculture Branch information on vegetables	12/93	9/93	10/94
j. Review farm income programs to replace central database with distributed tables	10/96	12/98	

2.10. Resources:

	THRU							Total
	FY97	FY98	FY99	FY00	FY01	FY02	FY03+	
Total Cost (\$000)	1,975	300	300	0	0	0	0	2,575
Staff-Years	26	5	5	0	0	0	0	36

2.11. Acquisition Description: None.

2.12. Departmental IRM Framework: This objective is aligned with the USDA IRM Technical Architecture.

3.1. Objective Title: Management/Operations of ERS Computer Room, LAN Administration, and Microcomputer Hardware and Software Support.

3.2. Status: Ongoing.

3.3. Objective Statement: To optimize performance of ERS equipment utilization by minimizing downtime and centralizing support of standard sets of software.

3.4. Strategy: Monitor usage and performance of agency-level systems and make board level repairs to microcomputers to keep equipment available to users. Develop standards for supported software products to minimize training and support costs and to improve software interactions.

3.5. Programs Supported: This is a core resource of the agency and is vital to achieving all program objectives.

3.6. Cross-Cutting or Interagency Programs Supported: Not applicable.

3.7. Background: ERS' Information Technology Services Branch provides support of in-house standard ADP equipment and software. With increased use of microcomputers and networked devices, this remains a critical support area.

3.8. Contact Name and Phone Number: A. Michael Ahrens—202-219-0761.

3.9. Major Milestones: No major new objectives. Maintain availability to users.

3.10. Resources:

	THRU							
	FY97	FY98	FY99	FY00	FY01	FY02	FY03+	Total
Total Cost (\$000)	*	748	765	783	810	838	0	*
Staff-Years	*	15	15	15	15	15	0	*

*Ongoing Support—not related to a specific initiative.

3.11. Acquisition Description: None.

3.12. Departmental IRM Framework: This objective is aligned with the USDA IRM Technical Architecture.

4.1. Objective Title: Ongoing Support of ERS Staff.

4.2. Status: Ongoing.

4.3. Objective Statement: To optimize the utilization of microcomputer systems in the process of creating ERS products.

4.4. Strategy: The majority of the analytical processes at ERS involve the use of off-the-shelf software packages to manipulate data received from external sources. A major charter for ISD is to provide the special assistance staff members may require in meeting their objectives. This is provided through many different methods depending on staff needs.

4.5. Programs Supported: This is a core resource of the agency and is vital to achieving all program objectives.

4.6. Cross-Cutting or Interagency Programs Supported: Not applicable.

4.7. Background: The Application Development Branch is chartered with providing direct support of program division projects. Each program division has unique needs and uses particular types of software in reaching program objectives. The majority of assistance is for one-time projects that generally require a small amount of time. Only a few require more than one staff-year of effort.

4.8. Contact Name: A. Michael Ahrens—202-219-0761.

4.9. Major Milestones: No major new objectives. Maintain responsive support to staff.

4.10. Resources:

	THRU							
	FY97	FY98	FY99	FY00	FY01	FY02	FY03+	Total
Total Cost (\$000)	*	1,150	1,190	1,231	1,275	0	0	*
Staff-Years	*	20	20	20	20	0	0	*

* Ongoing Support—not related to a specific initiative.

4.11. Acquisition Description: None.

4.12. Departmental IRM Framework: This objective is aligned with the USDA IRM Technical Architecture.

5.1. **Objective Title:** Year 2000 Conversion.

5.2. **Status:** New.

5.3. **Objective Statement:** To assure all systems are Year 2000 compliant.

5.4. **Strategy:** ERS is participating with the Department in preparing for processing after 1999. ERS has a Year 2000 coordination who is a member of the Departments oversight committee. Inventories have been prepared and tasks are being assigned to convert all areas.

5.5 **Program Supported:** This covers are aspects of automation throughout the Agency.

5.6. **Cross-Cutting or Interagency Programs Supported:** Year 2000 Task Force.

5.7. **Background:** The Agency assigned a Year 2000 coordinator who will monitor all activities within the Agency and report progress to the Department.

5.8. **Contact Name and Phone Number:** John Baumgartner 202-501-7954.

5.9. **Major Milestones:**

	Planned		Actual
	Start Date	End Date	End Date
a. Establish Agency Project Team	10/96	10/96	10/96
b. Develop Strategy/approach	10/96	1/97	1/97
c. Create agency awareness	1/97	3/97	3/97
d. Assess extent of conversion	1/97	12/98	
e. Renovation of identified systems/components	3/97	12/99	
f. Validation of new systems and renovated system	6/97	12/99	
g. Implement Year 2000 compliant system	6/97	12/99	

5.10. **Resources:**

	THRU							Total
	FY97	FY98	FY99	FY00	FY01	FY02	FY03+	
Total Cost (\$000)	150	260	260	30	0	0	0	700
Staff-Years	2.25	4	4	.5	0	0	0	10.8

5.11. **Acquisition Description:** Not Applicable.

5.12. **Departmental IRM Framework:** This objective is aligned with the USDA IRM Technical Architecture.

CHAPTER V

**National Agricultural Statistics Service
(NASS)**

AGENCY FY 1999 PERFORMANCE AND IRM LONG-RANGE PLAN OVERVIEW

1. INTRODUCTION

NATIONAL AGRICULTURAL STATISTICS SERVICE

The mission of the National Agricultural Statistics Service (NASS) is "to serve the United States, its agriculture, and its rural communities by providing meaningful, accurate, and objective statistical information and services." NASS is an agency within the Research Education, and Economics (REE) Mission Area of the U.S. Department of Agriculture. NASS's program of current official estimates and the Census of Agriculture is complemented by its Statistical Research and Service Program. This component works to improve statistical survey methods and to test advanced technology for timely and cost efficient production of high quality agricultural statistics. NASS also performs important reimbursable survey work for other Federal, State, and private organizations as well as providing technical assistance for agricultural statistics programs in developing countries.

A. FY 1999 PERFORMANCE PLAN

This FY 1999 Performance Plan is a blueprint of the program objectives and FY 1999 performance goals of NASS. The performance plan is closely linked to the NASS and REE Strategic Plans, and is framed by the six REE general outcomes outlined in those strategic plans. These general goals are:

- An agricultural system that is competitive in the global economy.
- A safe and secure food and fiber system.
- A healthy, well-nourished population.
- An agricultural system which protects natural resources and the environment.
- Enhanced economic opportunity and quality of life for Americans.
- Enhanced communications and infrastructure for improved service.

The performance plan describes outcome-oriented objectives for each general goal. The plan also includes program activities that will be carried out in pursuit of those objectives and performance measures.

The assessment of NASS performance is dependent on explanations from data users and customers as to the value and relevance of its products and services. For example, NASS statistics contribute to the orderly function of marketing systems production in the agricultural sector. Timeliness is easily measured by the percent of preannounced due dates met, but the degree to which NASS contributes to the outcome of an efficient commodity market can only be based on the judgement of the data user. NASS must obtain these judgements through periodic customer satisfaction surveys. Other assessments of whether NASS is favorably impacting the desired outcomes specified in this plan will be needed from subject matter experts, such as public and private economists, the media, farmers, ranchers, and other data users.

NASS program activities are budgeted for: 1) Agricultural estimates; 2) Statistical research and service; and 3) Census of Agriculture. Agricultural estimates provide the official national and State forecasts and estimates of acreage, yield, and production of crops, stocks of commodities stored, livestock inventory numbers, and prices and value of farm commodities. These data are important to all participating in the highly competitive agricultural markets. Information is also provided for planning and policy decisions concerning agricultural chemical use, farm labor, prices paid by farmers, and farm expenditures. Statistical research and service is funded to seek improved methodologies for greater accuracy and improved efficiency in the agricultural estimates and agricultural census programs. Agricultural census data are particularly valuable at the local community level for community planning purposes and for making economic decisions for specific localities.

NASS State Statistical Offices regularly survey thousands of operators of farms, ranches, and agribusinesses which provide information on a confidential basis. These scientifically designed surveys provide the basis for developing estimates of production, supply, price, and other aspects of the agricultural economy. Official USDA national, State, and county estimates and reports are issued relating to acreage, types and production of farm crops; number of livestock on farms and of livestock products, stocks of agricultural commodities, value and utilization of farm products, farm labor, prices received and paid by farmers, agricultural chemical use, and on other subjects as needed. The State Offices forward the estimates to NASS Headquarters where they are combined and released at scheduled times to the media and public through the Agricultural Statistics Board. Annually, NASS publishes over 400 national reports which cover more than 120 crop and 45 livestock items. These publications are complemented by additional State reports. These basic and unbiased data are necessary to maintain an orderly association between the consumption, supply, marketing, and input sectors of agriculture.

Research is conducted to improve the statistical methods and techniques used in developing U.S. agricultural statistics. The highest priority of the research agenda is to aid the NASS estimation program through development of better estimators at lower cost and with less respondent burden. This means greater efficiency in sampling and data collection coupled with higher quality data upon which to base the official estimates. In an environment of escalating demand for statistical information but shrinking resources, continued service to users will be increasingly dependent upon methodological and technological efficiencies.

The Census of Agriculture is taken every 5 years and provides comprehensive data on the agricultural economy including: data on the number of farms, land use, production expenses, farm product values, value of land and buildings, farm size and demographic characteristics of farm operators, market value of agricultural production sold, acreage of major crops, inventory of livestock and poultry, and farm irrigation practices. The next agricultural census will be conducted beginning in January 1998 for calendar year 1997 and will provide national, State, and county data as well as selected data for Puerto Rico, Guam, the U.S. Virgin Islands, and the Northern Mariana Islands.

Services are performed for other Federal and State agencies and private commodity organizations on a reimbursable basis. These services consist primarily of conducting surveys and performing related data collection activities. They also include technical consultation, support, and assistance for international programs under participating Agency service agreements.

NASS GPRA program activities include the Statistical Research and Service support program with the Agricultural Estimates and the Census of Agriculture activities. The latter two programs are directly served by the research. The performance of NASS research will therefore be measured through the same performance goals and indicators used to evaluate the outcomes of the statistical program for agricultural estimates and the census. All appropriated funds, including research, are associated with the goals, objectives, and performance measures for the GPRA program activities in this annual plan.

GENERAL GOAL NO. 1:

Through research and education, empower the agricultural system with knowledge that will improve competitiveness in domestic production, processing, and marketing.

GENERAL OUTCOME NO. 1:

An agricultural system that is competitive in the global economy.

Objective 1.1: Promote an economically viable agriculture production system.

NASS Objective 1.1: Provide timely and accurate agricultural statistics that are used to determine supplies and competitive prices for marketing of U.S. commodities.

NASS Program Activities:

Examine the relevancy of statistical products by profiling the content, scope, frequency, and coverage provided compared to user needs.

Conduct a "process reengineering" of data collection and estimation to improve efficiency and timeliness of the statistical program.

- Systematically review each step of data collection, processing, and estimation of production and price statistics to improve quality and timeliness.
- Standardize edits, summaries, and estimates submission.
- Convert editing and analysis to an interactive process.
- Provide each staff direct access to source data through implementation of a data warehouse.
- Link camera copy and published estimates data bases with Agricultural Statistics Board and indications data bases.

Produce official estimates on the date and time specified.

NASS Performance Outcome 1.1:

Producers and other data users have objective, reliable, and timely data provided, according to a pre-determined schedule, with which to make informed production and marketing decisions.

NASS Performance Targets 1.1:

Indicator: NASS reports are complete, meet scheduled release dates, and contain no publication errors

Goal: 99 percent of releases

Indicator: Data users surveyed, including advisory group representatives, rate production and price data series as relevant or highly relevant

Goal: 90 percent of the time.

Objective 1.2: Develop agricultural products and processes to enhance marketability.

NASS Objective 1.2: Describe production agriculture as fully and as accurately as possible.

NASS Program Activities:

Evaluate trends and changes in production agriculture and adjust NASS statistics program accordingly.

Publish NASS statistics at the finest level of detail supportable by the data available.

Improve the consistency between estimates from sample surveys and censuses.

NASS Performance Outcome 1.2:

A complete picture of existing U.S. agricultural products and sales.

NASS Performance Targets 1.2:

Indicator: National production statistics reported annually as a percent of all agricultural cash receipts in the National Income Accounts.

Goal: 98 percent coverage.

Objective 1.3: Expand global markets for U.S. agriculture.

NASS Objective 1.3: Promote a level playing field in production agriculture with impartial statistics available to all at a predetermined and publicized date and time.

NASS Program Activities:

NASS provides current statistics on 120 crops and 45 livestock items. These estimates and forecasts are the only official data used in the marketplace to evaluate the current supply situation and contribute to the determination of market prices.

NASS Performance Outcome 1.3:

Production data for competitive pricing in the global marketplace for U.S. agricultural production.

NASS Performance Targets 1.3:

Indicator: NASS data are rated as important or essential to the orderly marketing of agricultural products.

Goal: 90 percent agreement among agricultural leaders in periodic customer surveys.

Indicator: Data security in connection with official releases.

Goal: Zero instances of impropriety.

GENERAL GOAL NO. 2:

To ensure an adequate food supply and improved detection, surveillance, prevention, and educational programs for the American public's health, safety, and well-being.

GENERAL OUTCOME NO. 2:

A safe and secure food and fiber system.

Objective 2.1: A secure production system.

NASS Objective 2.1: Provide meaningful statistical projections that enable farmers and the marketing channels to minimize economic risk and provide food security for consumers.

NASS Program Activities:

Forecast crop yields and livestock production to help analysts project accurate trends into the future.

Provide data on management practices and economics useful for decision making and risk assessment.

NASS Performance Outcome 2.1:

Essential production data are provided for analyzing policy and program consequences for producers and consumers.

NASS Performance Target 2.1:

Indicator: NASS data are rated as important or essential to forecasting, analysis, and risk assessment.
Goal: 90 percent approval rating among agricultural leaders.

Objective 2.2: Preharvest food safety.

NASS Objective 2.2: Provide important data on preharvest chemical applications for informed evaluations of risk potential associated with using or discontinuing chemicals relative to both food safety and food security.

NASS Program Activities:

Conduct surveys to provide needed data on types and amounts of chemicals applied by producers and associated economic information to evaluate importance.

NASS Performance Outcome 2.2:

Measure progress toward National goal for using integrated pest management practices on U.S. farmland to promote preharvest food safety practices.

NASS Performance Targets 2.2:

Indicator: NASS provides USDA with required measures for the proportion of farmland employing Integrated Pest Management practices.

Goal: 100 percent of required data supplied.

Indicator: Customer satisfaction surveys rate chemical use data series and data products as relevant or highly relevant.

Goal: 90 percent approval rating.

Objective 2.3: Postharvest food safety.

NASS Objective 2.3: Provide important data on postharvest chemical applications for informed evaluations of risk potential associated with using or discontinuing chemicals relative to both food safety and food security.

NASS Program Activities:

Measure chemicals applied to targeted agricultural products during storage, packing, and shipping.

NASS Performance Outcome 2.3:

Comprehensive analyses of chemical use is made possible by measures of chemicals applied during storage, packing, and shipping of agricultural products.

NASS Performance Target 2.3:

Indicator: NASS data are rated as important or essential to the monitoring of postharvest chemical applications among these data users.

Goal: 90 percent approval rating.

GENERAL GOAL NO. 3:

A healthy and well-nourished population who have knowledge, desire, and means to make health promoting choices.

GENERAL OUTCOME NO. 3:

A healthy, well-nourished population.

Objective 3.1-3.4: Monitoring and surveillance, optimal nutritional requirements, nutritious food supply, and nutrition education.

NASS Objective 3.1-3.4: Provide statistical advice, consultation, and services to USDA and State agencies concerned with health, nutrition, and education when seeking new data or the statistical analysis of existing data for policy decisions.

NASS Program Activities:

Make available upon request properly trained and experienced staff who possess the statistical expertise and survey capabilities for assisting other organizations both within and outside of USDA with their survey and analysis responsibilities.

NASS Performance Targets 3.1-3.4:

Indicator: Reimbursable clients are satisfied or very satisfied with NASS statistical services.

Goal: 90 percent approval rating.

NASS Performance Outcome 3.1-3.4:

Policy decisions are based on statistically sound data and analyses.

GENERAL GOAL NO. 4:

To enhance the quality of the environment through gaining a better understanding of and building on agriculture's and forestry's complex links with soil, water, air, and biotic resources.

GENERAL OUTCOME NO. 4:

An agricultural system which protects natural resources and the environment.

Objective 4.1, 4.3, 4.4: Sustain soil resources, air quality, and an ecosystem that balances needs for biodiversity.

NASS Objective 4.1: Provide statistical data on agricultural chemical use, production practices, land productivity, and integrated pest management practices so proper decisions can be made regarding stewardship of America's rural resources and the environment.

NASS Program Activities:

Conduct surveys to provide needed information concerning cropping practices and the quantities of chemicals applied to agricultural commodities.

NASS Performance Outcome 4.1:

Information is relevant to Policy and production decisions associated with land use, chemical use, and integrated pest management on U.S. farms and ranches are based on useful and statistically sound data.

NASS Performance Target 4.1:

Indicator: New Initiative--a crop specific geospatial data layer contributes important new information for environmental evaluation as part of the President's National Spatial Data Infrastructure (NSDI) initiative.

Goal: Coverage for six States having 35 percent of U.S. harvested acreage in the first year.

Objective 4.2: Conserve water resources and enhance water quality.

NASS Objective 4.2: Provide high quality, relevant, and timely statistics in support of effective stewardship of America's rural resources and the environment.

NASS Program Activities:

Work in partnership with other organizations to provide effective and efficient data collection programs to measure environmental characteristics that affect water quality.

NASS Performance Outcome 4.2:

Informed decisions regarding stewardship of America's water resources are based on useful and sound statistical data.

NASS Performance Target 4.2:

Indicator: Customer satisfaction surveys of clients in the natural resource area show ratings of satisfied or very satisfied with the quality of NASS environmental statistics.

Goal: 90 percent approval rating.

GENERAL GOAL NO. 5:

Empower people and communities, through research-based information and education, to address the economic and social challenges of our youth, families, and communities.

GENERAL OUTCOME NO. 5:

Enhanced economic opportunity and quality of life for Americans.

Objective 5.1: Viable local economies.

NASS Objective 5.1: Provide detailed data from the Census of Agriculture at specified intervals to facilitate locality based policy and business decisions benefiting farmers, ranchers, and rural residents.

NASS Program Activities:

Collect information on the Census of Agriculture which provides detailed data at local levels on the characteristics of the agricultural sector of rural America.

NASS Performance Outcome 5.1:

Greater economic opportunity and quality of life is made possible for those most in need through policy and program decisions based on sound statistical data from agricultural censuses and surveys.

NASS Performance Targets 5.1:

Indicator: Census of Agriculture data for 1997 will be collected and processed during 1998 and released earlier than the previous census.

Goal: Release by April 1999, 5 months earlier.

Indicator: The Census of Agriculture is considered a reliable or highly reliable source of demographic information on the farm sector by those involved in rural community activities.

Goal: 90 percent approval rating.

Indicator: Key stakeholders rate the 1997 Census of Agriculture results as equal to or better than earlier censuses.

Goal: 90 percent approval rating.

Indicator: Coverage of minority operated farms will be more complete than the last Census of Agriculture as measured by coverage evaluations.

Goal: Under coverage of minority farms is at least 25 percent less than in 1992.

Objective 5.2 and 5.3: Sustainable communities, and strong families and contributing individuals.

NASS Objective 5.2 and 5.3: Provide necessary and sufficient economic data on prices, labor, cost of production, farm numbers, and farm income to enable informed policy decisions to benefit farmers, ranchers, and rural residents.

NASS Program Activities:

Conduct surveys to monitor the economic status of those who operate and work on the nation's farms and ranches and provide needed data for policy analysis. Assist the Bureau of Economic Analysis (BEA) in providing accurate measures of economic activities at the county level.

NASS Performance Outcome 5.2:

NASS 1997 Census of Agriculture data provide useful information on factors that impact the well-being of local communities and the characteristics of places most in need of assistance.

NASS Performance Target 5.2:

Indicator: Customer satisfaction surveys and the BEA rate economic data for the farm sector as relevant or highly relevant.

Goal: 90 percent approval rating.

GENERAL GOAL NO. 6:

Marshal the diverse human and physical resources and capabilities to respond in a timely, responsible, and open fashion to emerging issues of internal or external concern.

GENERAL OUTCOME NO. 6:

Objective 6.1: Enhanced communications and infrastructure for improved service.

NASS Objective 6.1: Introduce new products and services and redesign existing products to meet changing customer expectations.

NASS Program Activities:

Provide ongoing dialogue between NASS and data users through advisory panels, industry/grower meeting participation, and data users meetings.

Generate new spatial products based on geo-referenced files and remote sensing products.

Performance Targets 6.1:

NASS publications provide important information which is presented using the best appropriate graphics and map products to display the information.

NASS responds to 100 percent of requests within 2 working days.

Over 90 percent of data users surveyed are satisfied or very satisfied with NASS service.

Performance Indicators 6.1:

Customer satisfaction surveys provide feedback on service.

NASS Objective 6.2: Inform customers about NASS products, procedures, and services. Improve customer access to NASS information.

NASS Program Activities:

Provide customers annually with the next year's release dates for all statistical reports, along with products and services currently available.

Provide the annual *Agricultural Statistics* publication which covers data generated by all agencies throughout USDA.

Make all reports available electronically on Internet through the NASS Home Page, USDA Home Page, White House Briefing Room, and FedStats.

Performance Targets 6.2:

Customers of NASS are satisfied or very satisfied with the service they receive.

Customers of NASS are satisfied or very satisfied with the NASS data products.

Objective 6.3: Employ a diversified and technically competent staff. Treat employees fairly and with respect.

NASS Program Activities:

Support cooperative programs with 1890 Land Grant, Hispanic, Native American, and other educational institutions to enhance the availability of minorities qualified for employment as statisticians or data processors.

Utilize and promote student assistants, cooperative students, stay-in-school, and other employment programs that assist in recruitment of highly qualified, diversified, and technically competent staff.

Make effective use of flexible work schedules and work locations.

Train every employee in human relations, work force diversity, sexual harassment issues, and ethical conduct as well as technical training in statistics and Information Technology (IT).

Performance Targets 6.3:

Diversified workforce reflects the population of women and minorities based on the CFL.

Employees request and are provided sufficient training to maintain a highly skilled staff.

More than 80 percent of employees are experiencing good to excellent morale.

Performance Indicator 6.3:

Organizational climate surveys provide feedback.

Objective 6.4: Strengthen training and job opportunities to align with employees' technical and managerial career goals.

NASS Program Activities:

Utilize Individual Development Plans (IDP's) to help employees plan career goals within the agency's career paths.

Design a broad training program to meet both individual and agency needs. Employees are encouraged to improve their statistics, computer, management, and communication skills through training. The NASS staff is also encouraged to increase their knowledge about agricultural and rural issues.

Provide different work experiences and versatility through encouraging staff mobility between the field and headquarters as well as between State offices.

Utilize cooperative agreements, exchange programs, contracts, and other interactive vehicles with academic, professional, and subject matter experts to expand staff capabilities.

Work with other organizations having expertise in agriculture, rural economics, statistics, technology, survey methodology, and information dissemination to strengthen their own staff's competence.

Performance Targets 6.4:

An adequate supply of qualified staff apply for all key vacancies in headquarters and field locations.

100 percent of NASS supervisors and managers have 80 hours or more of management/leadership training.

100 percent of non-supervisory personnel have an up-to-date Individual Development Plan. Training needs identified in these plans are met 90 percent of the time.

Evaluations indicate staff capabilities increase following training.

Objective 6.5: Allocate financial and human resources effectively.

NASS Program Activities:

Provide adequate resources to support the cost of relocation for employee development through providing opportunity to work in different field offices and headquarters for all qualified employees.

Provide a year's graduate training for employees qualified to improve their statistics or data processing skills.

Nominate at least one employee for the Executive Potential Program (EPP) or similar programs each year.

Performance Target 6.5:

Employees are provided opportunity to work in different locations and obtain specialized training 90 percent of the time.

Performance Indicator 6.5:

Number of employees who apply for every leadership positions.

Objective 6.6: Ensure an effective information resource management system maximizes productive capability and facilitates communication for employees.

NASS Program Activities:

Prepare a formal IRM plan to evaluate current capabilities and future requirements, and to assure consistency with Departmental standards and guidance.

Work with the Department to facilitate interconnectivity.

Performance Targets 6.6:

No report due dates are missed because of equipment failure and less than 10 percent of employees cite equipment problems as a negative work factor.

Downtime on field office and headquarters LAN's is less than 3 percent of the core workday.

Performance Indicator 6.6:

Equipment performance.

Objective 6.7: Strengthen the NASS administrative infrastructure.

Performance Targets 6.7:

Administrative systems operates efficiently.

Over 80 percent of NASS managers rate the administrative systems favorably.

Performance Indicator 6.7:

NASS managers provide feedback.

B. AGENCY IRM LONG RANGE PLAN

NASS implemented a restructure of its Headquarters, located in Washington, D.C., effective February, 1997, to include the addition of the Census Division. The organizational chart, attached as Attachment A, indicates the major division of responsibilities within the Agency. The Systems and Information Division (SID) provides major information systems support to its customers, which are all other Divisions in the Agency as well as NASS data users. The Division includes three Branches; the Systems Services Branch, the Technical Services Branch, and the Information Services Branch. The Division is comprised of approximately 80

employees. A copy of the SID organizational chart is included as Attachment B. SID is responsible for NASS's information management system and processing services.

The Division's mission is to maximize effective technology usage in the collection and processing of agricultural information, and the impartial distribution of agricultural estimates to NASS customers.

Specific responsibilities are to:

1. Plan, direct, and coordinate Agricultural Statistics Board (ASB) activities to facilitate the issuance of reports.
2. Analyze, design, develop, test, and implement new information handling systems using current data processing technology.
3. Manage and assure security of automated records, develop physical data base file structures, populate and maintain data base files, and operate the Agency's data systems.
4. Maintain and support existing computer hardware/software systems and communications networks.
5. Coordinate computer systems installation and operations.

Specific Division outcomes and achievements include:

a. Data Dissemination

- ▣ Over 380 hardcopy reports a year are generated and released through a contracted subscription service.
- ▣ Several electronic diskette products are purchasable from NASS or obtained free through Internet.
- ▣ National and State releases are available on the NASS Home page within minutes of the release.
- ▣ A FAX on demand is provided for high-demand reports.

⇒ A Published Estimates Data Base (PEDB) of historic data is directly accessible by FSA, ERS, FCIC, and APHIS.

⇒ An annual book titled Agricultural Statistics is published, and it is also available on CD ROM and Internet.

⇒ Many catalogs, ASB calendars, and other promotional materials are published to make customers aware of NASS report availability.

b. Computer Systems Support

⇒ A high-speed Wide Area Network will become a key component of the USDA Backbone Network.

⇒ Since 1971, Agency computer systems and communication networks have been furnished through commercial contracts administered by the Division. Lockheed Martin (Martin Marietta) has been the mainframe supplier since 1979. The NASS data network, which connects all offices, is furnished by the GSA FTS2000 contract.

⇒ Forty-six (46) Agency LAN's, with over 1,100 individual workstations, are connected to a large mainframe and supported by a highly technical staff. This technology should migrate smoothly to the USDA Technology Architecture when it is finished.

⇒ All NASS employees have access to a full set of standardized technology including e-mail, word processing, spreadsheets, graphic tools, etc.

⇒ Generalized software systems provide the main processing tools for collection, editing, and summarization of all surveys.

c. Future Outcomes

⇒ Processing of the 1997 Census of Agriculture will be provided through an interagency agreement with the Census Bureau. The publication of census results will be accelerated from 3 to 6 months.

Data Dissemination:

➡ The Cornell University agreement will be extended for 3 more years, and will include expanded and enhanced service offerings. There are approximately 30,000 accesses currently to NASS data. More users are expected as the use of Internet increases and the knowledge that NASS data is available becomes more widespread. The System also services over 10,000 subscriptions.

➡ NASS will reengineer the Published Estimates Data Base (PEDB) to make it available on Internet through a NASS administered WEB Server.

➡ An agreement with GSA's National Technical Information Service (NTIS) will replace the hardcopy report subscription and dissemination service when the current contract expires in the fall of 1997. The use of the Department's CIDS contract will cease with its expiration in the fall of 1997. The services currently offered by CIDS are now available through NASS Internet offerings.

Computer and Telecommunications Technology:

➡ NASS is making a major move to distributed client/server computing using relational data base technology.

➡ The use of Geographic Information Systems (GIS), remote sensing, and georeferencing devices are expected to increase.

➡ NASS intends to use the USDA wide-area communications network to implement new functions such as remote LAN management, video conferencing, document archiving and retrieval systems, GIS, and data sharing.

➡ A major effort is underway to organize all relevant data into a series of data warehouses which can be accessed and shared through powerful analysis tools. When appropriate, these data sets should contribute key components to the USDA data architecture.

➡ The Division is in the process of upgrading all field LAN servers to enhance the system capacity to handle over 300,000 computer assisted telephone interviews in the spring of 1998.

- The Division will upgrade all LAN systems to 32-bit architecture to facilitate the migration to the USDA Technical Architecture.

On a limited scale, other IT functions, including application development, application system maintenance, and IRM technology research exist in other NASS divisions. The Field Services Section, located in the Colorado SSO, develops and maintains software systems especially geared to field offices. The Statistical Methods and Programming Branch, within the Census Division, maintains the Census Edit and summary systems, and the various Sections, within the Research Division, conduct research on the potential usefulness of new hardware and software technologies.

The Agency has a staff of about 1,300 full-time Federal and State employees, one-fourth at Headquarters and three-fourths in the field. Approximately 115 of the employees are directly involved in IT support as computer specialists, technical specialists, data administrators, programmer analysts, LAN administrators, and managers. They are located throughout the Agency, in each division. A primary and backup LAN administrator is located in every Field Office, and in each branch in headquarters. As previously indicated, IRM issues are coordinated through the Systems and Information Division. Due to the unique program of NASS, which is essentially an information processing organization, many more people support the traditional IRM functions of data collection, processing, analysis, dissemination, and management.

Development of major processing systems for the Agency is performed through special Agency work teams. Systems, such as those used for Headquarters processing of major reports, are prepared in Headquarters to specifications drawn up by the Estimates Division. SSO's do varying amounts of systems development depending upon their State responsibilities and their staffing levels. Many new State survey projects can be totally handled by commodity statisticians through coding parameters for existing generalized routines.

In addition to the data processing approaches used for NASS operational programs, extensive development efforts have gone into processing procedures for utilization of spatially referenced information. This work is concentrated in the Research Division. Remotely sensed and other geo-referenced data are analyzed via image processing and geographic information systems (GIS) technology to study their use for crop acreage estimation, crop condition assessment, and graphical presentation of survey and/or estimates.

Spatial research areas include the development of an expert systems approach for moving remote sensing analysis of crop acreage to Field Offices, investigating GIS

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applications for Field Office LAN's, integration of GIS and satellite image processing for color map products, improved yield estimation based on data obtained from precision farming operations, and crop specific digital data layers.

Outcomes to date include:

- 1) The operational area frame sampling methodology which has benefited most directly from the spatial analysis research; the Computer Assisted Stratification System (CASS), currently used by the Area Frame Section, was developed directly from previous remote sensing research efforts.
- 2) Survey information collected from area frame segments is combined with satellite remote sensing data to improve State and county crop acreage estimation in Arkansas, North Dakota, and South Dakota.
- 3) Satellite-based vegetation indices have been used by the Agricultural Statistics Board to assess large area crop conditions such as those which occurred during the 1993 Midwest flooding, the bumper crop year in 1994, the early freeze in 1995, and the 1996 drought in the Southwestern Plains winter wheat areas. Image products based on these indices are loaded to the NASS web site every 2 weeks and have proven popular with data users.

2. IRM PLANNING PROCESS

NASS management utilizes an IRM Review Board as a subcommittee of the NASS Strategic Planning Committee (SPC) to prioritize all system development, compile and approve the Long-Range Information Resource Management Plan, and oversee the utilization of resources. The Board is chaired by the Senior IRM Officer (SIRMO) for NASS, the Systems and Information Division Director. Membership includes senior representatives from all NASS Divisions plus one Field Operations person. The SIRMO is responsible for the review and approval of all major ADP acquisitions. This assures that IT initiatives link directly to the goals, objectives, and strategies established in the Agency Long-Range IRM Plan.

The formal IRM planning process begins with annual meetings called by the Systems and Information Division's Director. Each participant is asked to review the Agency's IRM goals, objectives, and milestones. These individuals are uniquely qualified to assist with the development of the Long-Range Plan. In their combined rolls of development, maintenance, support, and administration of hardware and software systems which support the NASS Estimates Program, they are in constant contact with other NASS Divisions involved in the collection, summarization, analyses and publication of agricultural forecasts and estimates. They are also present at conferences with representatives of other agencies within the Department when the requirements for interagency initiatives are being developed.

The result of these meetings, the proposed IRM Long-Range Plan, is then presented to the IRM Review Board. The Board reviews the plan and suggests modifications. Acceptance of the plan is dependent on a majority vote from members of the Board. The Plan is then presented to the SPC for its approval. Agency acceptance of the plan is dependent on a majority vote from the SPC. Since all NASS senior management serves on the SPC as well as all other major management committees of the Agency, there is tight linkage with overall program plans, budget, personnel, training, administration activities, and crosscutting initiatives.

The planning assumptions used in the development of the Long-Range Plan are:

- o The primary mission of NASS will continue to be providing the official agricultural statistics required by U.S. code, USDA regulations, USDA policy planning needs, cooperative agreements, and private or public funding agreements, and the National Census of Agriculture.
- o Timely and accurate forecasts of crop conditions and yields will continue to be the most important information provided by NASS.
- o Research will be performed to improve both statistical methodology and technology for the collection, tabulation, and distribution of information.
- o The entire agricultural community needs to be served in some capacity. This includes preparation of specialty and/or rare commodity estimates.
- o There will be more emphasis on reducing the data collection burden on farmers, agribusinesses, and the general public.
- o There will be increased need for local area data such as county estimates.
- o The demand for reliable and timely estimates will increase.
- o Increases will occur in data processing costs, the use of consultants, and training requirements.
- o The IRM plan will grow and change.

Basic IRM policies used in the development of the Long-Range Plan are:

- o Centralized coordination of ADP activities, including procurement.
- o Agency ownership of data rather than individual unit ownership.
- o Standard data handling procedures (edit, summary, imputation, and analysis).
- o Unified Agency-wide data management system.
- o Standardized computer and communication technical architecture throughout the Agency.

The NASS Core Business Processes identified for IRM Planning purposes are:

1. Management
2. Data Collection and Summarization
3. Data Analysis and Estimation
4. Publication and Distribution of Data
5. Training and Transfer of Knowledge
6. Sampling Frame Universe Maintenance
7. Statistical Research

3. CURRENT IRM ENVIRONMENT

Almost all major information systems are supported by the Systems and Information Division (SID). This Division is responsible for management of the information and processing systems. Specifically the Division designs, maintains, and provides appropriate access to integrated and standardized systems. The Division tests, implements and maintains almost all applications systems within the Agency. Contracts are used for some software development. The Division also develops specifications and monitors contracts for specialized technology assistance. SID provides end-user support for all users in Headquarters and the Field.

In addition to the SID function, the Field Operations maintains a small technical staff in each Field Office and a Field Services Section (7 people) attached to the Colorado Field Office. This staff provides additional local technical support to the Field Offices. The new Census Division also has a Systems Development and Support Section (20 people) that maintains the Census application systems transferred from the Department of Commerce.

Standard Technology Architecture

NASS recognized the need to standardize hardware and software technology to ensure resources expended on application systems are invested consistently with cost-effective

information sharing, and the resulting systems having a long useful life. To accomplish that, it was necessary to define a Standard for Processing Technology (SPT) encompassing fundamental data processing and communications systems. The SPT includes contract processing facilities, such as a network processing center, as well as locally owned or managed components such as terminals, microcomputers, and minicomputers. The components of the SPT are intended to facilitate integrated systems and information sharing within NASS.

The basic purpose of the SPT is to control the number of information processing technologies to a reasonably functional subset of those available in the market place. It significantly improves data and information sharing through better integration and avoidance of incompatible hardware and software. It also controls the number of technologies needing support.

Individual organizational units may augment the SPT when local needs and design considerations indicate this is desirable and cost-effective. Augmentation of the SPT recognizes that SPT may not, at any given time, provide all needed functionality. The mission of some units requires additional technologies, such as remote sensing and geographic information systems.

Managers in NASS are responsible for assuring that SPT is adhered to in their respective units. The Director of the SID assures that all major acquisitions either adhere to the SPT or are exempted. SPT components are reviewed and updated by the IRM Review Board at least annually. The use of a SPT substantially tempers the impact of migrating to the forthcoming USDA Technical Architecture.

Local Area Networks (LAN's)

The NASS main Headquarters office is located in the South Agriculture Building. Each of the approximately 250 employees has access to a Windows-based 486 or higher workstation connected to a series of Novell NetWare 4.11 production servers, and a cluster of IBM RS/6000 UNIX servers.

Forty-three NASS Field Offices, the Census Division in Suitland, Maryland, and the Research Division have LAN's with Novell NetWare 4.11. The size of the staff in these offices varies from 5 to 75 employees, and has a standardized LAN configuration. Each LAN has two file servers. The primary server provides ongoing file services while the other is held in reserve. A tower server contains five 9-gigabyte drives configured as a RAID5 composite drive. The

disks are controlled by a Power Edge Raid Controller (PERC). The RAID configuration, provides 18 gigabytes of data storage to the system.

In addition to the production servers, NASS utilizes a prototype and BETA server for both the Headquarters' and State Statistical Offices' LAN environments. All new hardware and software are first tested on the prototype server, migrated to the BETA server for full integration testing, and then migrated to the production servers.

In addition to the regular LAN configuration, NASS has a unique LAN configuration in its satellite office in Fairfax, Virginia. This satellite office houses the Research Division, which is a major user of image processing and geographic information system technology. Several platforms, each with very specialized hardware and software systems, are connected via four integrated Ethernet segments (three 10BaseT and one 100BaseT) in this office. In addition to a NOVELL file server and related workstations maintained for compatibility with operational NASS units, there is a second NOVELL file server, two SUN servers, three Windows NT servers, and a MicroVAX 3500 batch-process server. The SUN servers communicate via TCP/IP and NFS, and are used to support three areas: to connect and serve Hewlett Packard graphic workstations for area frame construction and analysis functions; to support several UNIX-based software packages, such as SAS, ERDAS Imagine, and ARC/INFO; and as file and system services for SUN workstations. The VAX-based system uses DECNET and TCP/IP to connect the MicroVAX (with 4 additional high-speed processor boards), a VAX-station 3100 graphic workstation, and high resolution graphic PC workstations. The MicroVAX is used for intensive analysis programs using very large (300 megabyte and larger) data files. The second NOVELL file server is used for specialized software not found in operational units. The Windows NT servers are used for moving GIS functions from UNIX-based systems used in area frame design to a generic hardware platform because of the cost of maintaining the UNIX hardware. All systems in this location can communicate with each other and share common resources (i.e. printers). A dedicated T-1 circuit links the Headquarters network, the Fairfax network, and the Census network through Cisco Routers, allowing access to all systems from any of these locations.

Telecommunications

All NASS LAN's have a 128 KB dedicated circuit connection for Wide Area Network (WAN) communications. Dedicated T-1 circuits are used to form a backbone with five hubs to service the non-hub States in a region. The NASS WAN facilitates client/server processes, to better accommodate 3270 and RJE activities, file transfers, centralized support, network management, imaging, and video conferencing. In addition, a Simple Mail Transfer Protocol (SMTP) gateway provides links between NASS E-mail and Internet E-mail throughout the

world. The NASS HQ LAN has a fiber link to the Departmental LAN which provides Department-wide access to other Internet services.

In December 1996, the final FTS2000 circuits were installed, completing the NASS WAN. Two remaining tasks are now underway. NASS is employing Cabletron's Spectrum SNMP as an enterprise-wide network management solution. It is also adding firewalls allowing increased operational functions and retaining proper security. This installed network will become an integral component of the planned USDA backbone network.

Mainframe Services

Lockheed-Martin provides mainframe processing services required by NASS. The mainframe is an IBM CMOS class machine running the MVS/ESA operating system. The full range of services are provided, including backups, off-site storage and disaster recovery. Major software systems include CICS, TSO, JES, COBOL, SAS, ADABAS/Natural and Easytrieve.

NASS employees manage the execution of large and sophisticated information processing systems remotely from their offices. This provides the functional equivalent of a mainframe computer in each office. Application software can be either centrally developed and supported, or developed, installed, and operated from a Field Office.

For processing and summarization of the 1997 Census of Agriculture, NASS will be contracting, through an interagency agreement, for the use of the Census Bureau processing center located in Bowie, Maryland. The Census System, as transferred to NASS, was designed to process on Department of Commerce DEC equipment. The timing of the Census transfer did not allow enough lead time for NASS to redevelop the system for a more generic processing platform.

Client/Server Systems

NASS has IBM RS6000 UNIX systems used as data servers within a client/server environment. These systems are primarily used for SYBASE databases and SAS. Databases are being implemented using SYBASE System 11 and Redbrick. Current databases include the Enhanced List Maintenance Operations (ELMO) and Farm Service Agency (FSA) producer data. A development and Beta environment have also been implemented.

The IBM RS/6000 RISC cluster has undergone significant technology enhancements. The cluster is now "high available" by using IBM's HACMP. The data volumes have been converted from a SCSI subsystem to IBM's SSA disk system. This enhances the "high

availability" among the system units on the cluster in the event of a "fail over" and also provides greater I/O speeds. Tape storage and archiving has moved from SCSI 8 MM units to IBM's Mag Star 3590 magnetic cartridges handled by robotic storage units giving very high capacity and high speed I/O. The backup and archiving is handled by IBM's ADSM, thus giving hierarchial storage management opportunities across numerous system units which may be running a variety of operating systems (i.e.: AIX, VAX, SUN, Windows 3.1/95/NT, Novell, Solaris, MVS. and OS 390). One MagStar system running ADSM can handle tape storage for all these operating systems.

Agriculture Research Laboratory

The Agriculture Research Laboratory, located within the Census Division, allows access to a specified subset of census microeconomic data. These micro data were collected by the Bureau of the Census in various surveys and Censuses, and they include statistics that quantify the economic operations of all types of farms. Currently, the AG Lab has datum for the Census of Agriculture (years 1982, 1987, 1992), the Farm and Irrigation Survey (FRIS) (years 1984, 1988), Agricultural Economics and Land Ownership Survey (AELOS) (1988), the Census of Horticulture (1988) and the Longitudinal File (1978, 1982, 1987, 1992). The AG Lab resides on SUN workstations in a UNIX-based environment. SAS is the preferred tool to use for research purposes. Because of the confidentiality issues involved with the micro data, only employees or people with Special Sworn status have access to the AG Lab.

NASS Data Architecture and Data System 2000

NASS subscribes to the philosophy that data are a corporate resource and do not belong to any specific individual organizational unit. This concept forms the foundation for the current and planned data architecture in NASS. To have the most useful information resource, an architecture composed of various types of data bases have been and will need to be constructed in the future. Regardless of the delivery platform, the data bases are classified as data warehouses, functional, and meta data reference tables. The NASS Data System 2000 goal is the construction of data bases in a singularly defined architecture under a central control in a distributed client/server relational data base environment. The meta data tables data bases generally contain data which are common to most functional applications throughout the Agency.

a. Historical Data Warehouse

To achieve the Data System 2000 vision, NASS is developing and implementing a Historical Data Warehouse, which will contain not only multiple years of survey,

census and administrative data from farm operators, but also related aggregate information such as NASS's survey indications and official agricultural estimates. The Historical Data Warehouse will provide a single and integrated data source for use by NASS's generalized sampling, survey, estimation, and publication systems. The Data Warehouse is being designed for easy access to pertinent data needed for effective analysis by all staff throughout our Agency. NASS's data warehouse will enhance sampling and estimation procedures, provide more data analysis capability, and improve NASS's data editing and imputation methods.

b. Metadata Reference Tables

The metadata reference tables contain information about the Agency's programs and specifications at the end user level. Metadata reference tables are contained in the Data Warehouse and in the Operational Data Stores. In the planned data warehouse implementation, this information is stored in tables that are directly linked to the data they describe. This results from the implementation of the star schema used by the data warehouse, and will greatly leverage and facilitate the use of these tables and their linkages by end users and developers. The metadata tables within the warehouse are maintained centrally and will be made available to every NASS end user for research and development of their own programs, applications, and delivery modules. Metadata reference tables are also used to drive the integrated software tools developed by NASS for maintenance and use of the warehouse and Operational Data Stores.

Examples of metadata include complete descriptions of data identification codes, survey information and specifications, and linkage information used to enhance drill down analysis. Metadata reference tables also ensure that data are applied within a statistically appropriate context for analysis and future applications development.

c. Operational Data Stores (ODS)

Operational Data Stores are application databases with bi-directional interfaces to the Data Warehouse. Operational Data Stores (ODS) are used by generalized applications that cover a major function of a mission-critical NASS process. The ODS share standard key fields that are supported by Operational Metadata files. After the ODS are used to capture and manipulate the data for a current NASS operation, the approved resultant data are posted to the Warehouse for use in further analytical research and for management decision support. The ODS may contain working data that are not stored in the Warehouse. It will also contain historical data that has been posted to the Warehouse, but is still needed to complete an operational process.

d. Public Access Database

NASS is developing a Public Access Database of Published Estimates to be accessed via the Internet. This database will eventually contain all NASS historic Published Estimates and will be updated within a day after publication with newly published NASS data. Query results will be available for on-screen viewing as well as in an electronic file for downloading.

Since NASS's data architecture is an agency level model using open access technologies, it can easily transition to a Departmental-level data architecture when it is finalized.

Use of Computer Assisted Survey Information Collection (CASIC)

Computer Assisted Survey Information Collection refers to computerized methods to collect and edit data such as computer assisted telephone interviewing (CATI), and interactive editing (IE). CATI and IE are available in 42 Field Offices (all except Alaska and Hawaii). The Field Offices have approximately 750 workstations that are used for CATI.

CATI refers to data collection by telephone from the SSO. The CATI management software automates many functions including form delivery to the interviewer, tracking appointments and maintaining administrative information relating to interviewer performance. For small samples, the SSO may choose to use other types of form delivery including a point-and-shoot method or manual delivery using "call sheets."

Automated instruments provide a more efficient, error-free computerized questionnaire than the traditional paper questionnaire. These instruments bring up each question on the computer screen in proper sequence and skips the interviewer to the next appropriate question after a response has been entered, thereby ensuring that the correct questions are asked.

Instantaneous edits of the data are performed which allows the interviewer to clarify any erroneous or unusual answers with the respondent, and data from previous surveys can be brought into the interview or editing process to obtain higher quality data. By integrating editing and data entry with the data collection, many traditional post-interview activities such as data entry, data editing, callbacks to resolve data problems and questionnaire filing, can be eliminated or minimized.

Data collection applications have been programmed using the Blaise software from Statistics Netherlands. Blaise is now the software of choice in NASS, because of its popularity with interviewers and it provides the extra benefits of interactive editing.

IE provides a LAN-based post interview "micro level" edit. The editor reviews each record on screen and makes corrections as needed. The status of the form is immediately updated allowing the user to continue editing the form or store it if it is accurate. IE has been shown to reduce overall editing time and will allow us to reduce and eventually eliminate the current mainframe batch edits. Once data are clean on the LAN, other post-data collection processes such as analysis, imputation and summary can also be run on the LAN, instead of the mainframe. A complete LAN-based post-collection survey system is operational for several of NASS's smaller, monthly surveys. In addition, various macro editing modules, using the Interactive Data Analysis System, have been implemented on the LAN's for NASS's major probability surveys as they are developed.

4. ACCOMPLISHMENTS

NASS's continued ability to meet the Agricultural Estimates Program requirements is based largely on its accomplishments in the use of various computer-based information processing platforms. Listed below are some of the more significant recent NASS IRM accomplishments.

A. SSO File Server Upgrade

All NASS Field Office LAN servers (production and beta) were upgraded. Each LAN has two Dell 4100 file servers. The primary server provides ongoing file services with 5 9-gigabyte disk drives configured as a RAID5 composite drive. The second server is used as a hot online backup. The server software has been upgraded to Novell Netware 4.11 (Intranetware) for all LAN's via the NASS initiated Novell Master License Agreement for USDA.

B. Electronic Information Dissemination to the Public

NASS is a major participant in the Departmental efforts to expand the use of electronic dissemination of information to the public. Reports issued by NASS have been available to data users through Internet and USDA's Computerized Information Delivery (CID) contract. Historic data files are available on the Internet and are also available to data users in the form of diskettes. Some of NASS' major reports are also available over the ERS/NASS Bulletin Board.

A major effort has been put into creating a useful NASS Home page on the Internet. The site contains many useful features and facts about the Agency. In addition, all National and several State releases are available through direct access mechanisms or an E-mail subscription service.

Through an agreement with the Albert Mann Library at Cornell University, NASS offers reprints, data sets and subscription services to key Agency data series. The popular service is also getting several thousand direct hits per week. Nearly 3,200 subscribers receive over 18,000 NASS reports and usage is continually increasing. Nearly 40,000 NASS data sets and reports are being downloaded monthly.

Features recently added to the NASS Home Page include:

- *Today's Reports* gives a quick and easy customer access to statistics on the Nation's agriculture less than 5 minutes after release. Reports are available at this location for 24 hours.
- *Reports by Calendar* allows access to statistical reports based on the date of release. Links to a report are made from the report title in the calendar format. The calendar also provides access to prior year reports.
- A *Subscribe E-Mail* "button" was added on the *Publications* page to access that service provided by Cornell. The free e-mail subscriptions are usually delivered to data users from Cornell within 15-30 minutes of the scheduled release time.
- A *Research* "icon" was added to the NASS Home Page which allows access to biweekly vegetative index maps for the entire United States, for the current year and several historic years.
- *Census* data was added to the NASS Home Page. The NASS web site was upgraded to provide several accesses to historical Census data.
- The *Agricultural Graphics* feature has been improved to include historical data presentations, geographic changes from previous reports, and the county yield and acreage data presented on U.S. maps. Graphics are also presented for Research project output such as satellite vegetative indexes.
- *State Statistical Offices (SO) Home Pages* were created for all field offices. The SO releases focusing on the agricultural situation in each

state are loaded for customer access. An e-mail subscription is available for a customer to have these reports delivered to their desktops.

- The 1997 annual USDA *Agricultural Statistics* book was loaded to the Internet in PDF files. The data in the PDF files were also converted to comma separated value files and made available as a value-added product.

C. **Pesticide Data Program - Analysis and Summary**

Data from several Pesticide Data Program surveys were edited, analyzed, and summarized using the Survey Processing System (SPS). In the past year, summarization procedures were enhanced to accommodate new sampling methods. A parameter-driven Chemical Use Report Utility was used to create both the Fruit and the Vegetables Chemical Use reports.

D. **Computer Assisted Stratification and Sampling**

The Computer Assisted Stratification and Sampling (CASS) system uses satellite imagery and digital line graph data (DLG) for area sampling frame construction and maintenance, allowing the final product to interface with other GIS information. The original development of this system took advantage of the state of the art technology at the time. This involved the use of high-end graphic workstations and machine dependent proprietary software, developed in conjunction with NASA Ames Research Center. Presently the Area Frame Section is implementing a Commercial-Off-the-Shelf (COTS) solution that will enable the system to be portable across many hardware platforms. ARC/INFO and ARCView will combine to allow vector digitization and GIS connectivity, and image processing will be accomplished using ERDAS Imagine. Thus, the Agency will have more flexibility in choosing new hardware platforms and allowing other users access to the system. The sampling portion of the system has been converted to a COTS solution. In addition to satellite imagery and DLG data, the COTS solution can also use as input digital ortho quads, scanned aerial photography and geo-referenced raster maps.

E. **Interactive Editing Implementation**

Blaise interactive editing (IE) on the micro-level is available on all applications for which a Blaise CATI instrument exists. Blaise IE has replaced the SPS edit

for a few smaller surveys and plans are to phase out the SPS edit for major probability surveys such as, Hogs, Cattle and Sheep during the next year. In addition to using IE with surveys collecting data by CATI, six States are using IE for editing the June Area Frame Survey, which is an omnibus survey collected on paper by personal interview. The data are keyed, read-in to the Blaise system in a batch operation, and then edited interactively.

F. Interactive Data Analysis System Implementation

In addition to interactive edits on the micro or within record level using Blaise, macro level edits or analysis is also available using an Interactive Data Analysis System. This system was developed by researchers in NASS using the SAS/AF and SAS/EIS software with some other customized applications in SAS. It provides graphical representation of the data, contains drill-down capability, provides listings of potential outliers, and eliminates the need to pull questionnaires from current or previous surveys to resolve discrepancies. Modules for hogs, cattle, sheep, and cattle on feed were used operationally in 1997. Additional modules for other commodities are under development within Research Division.

G. Expert System for Crop Identification

The basic goal of this project is to transfer the capability for remote sensing analysis and crop identification to NASS Field Offices. The first step was to convert the Agency's PEDITOR remote sensing analysis software system to the WINDOWS environment: all major graphics modules have been converted, and many minor utilities have been converted. The second step was the development of a project management system, based on Visual FoxPro, for ground data and related imagery; the prototype management system was tested in Arkansas in 1996. The Arkansas, North Dakota and South Dakota Field Offices will completely control their ground data management in 1997.

H. Geographic Information System (GIS) Technology

Geographic Information Systems (GIS) methodology is used to store, access, manipulate, and analyze spatial data sets and their relationships. Agriculture related data inputs to the Research Division GIS database include NASS county estimates, crop weather and crop progress reports, earth resources and weather satellite data, soils maps. USGS Digital Line Graph of transportation and

hydrology networks, ground station weather data, and statistical samples from surveys which have been geographically referenced.

I. Evaluation of Commercial Off-the-Shelf Record Linkage Software.

As part of the Agency's effort to convert systems from a mainframe environment, researchers evaluated "off-the-shelf" software to link duplicate name and address records from a database in a client/server environment. The migration of record linkage functions off the mainframe will reduce processing costs and potentially improve the quality of the list frame and associated multiple frame indications since duplication among and within list sources can be identified and resolved more quickly and on a more recurring basis. After developing evaluation criteria for record linkage computer packages in both on-line and batch mode, and evaluating several commercially available packages, AUTOMATCH, and its companion software, AUTOSTAN were chosen as the core components of a new record linkage system. Researchers are now assisting Systems and Information Division in implementing this package.

J. List Maintenance Operations

The Enhanced List Maintenance Operations (ELMO) system became fully operational in all States in 1997. ELMO is the first major client/server database application to be implemented under the NASS Data System 2000 IRM objective. The application is supported by a central Sybase database running under Unix on an IBM RS/6000 RISC cluster platform. The distributed client software is PowerBuilder applications running in Windows 3.1. The ELMO system is used in Headquarters and all NASS field offices to maintain the NASS sampling frame universe. The next phase, ELMO II, is in its specification stage. ELMO II will cover sampling activities on the ELMO database.

K. Estimation and Publication Tools and NASS Estimates Database System

Several Estimation and Publication Tools (E&P Tools) were used to produce NASS estimates and reports for Cattle, Sheep, Wool, Turkeys, Floriculture, and Farm Labor. NASS Estimates Databases for Operational Data Storage (NEDS ODS) were populated for use by the E&P Tools for each of these commodities. This resulted in faster processing and better quality estimates. It also allowed for better integration across the joint Livestock Production, Disposition, and Income report.

5. FUTURE DIRECTION AND NEW TECHNOLOGY RESEARCH

Research into an expert system for crop identification based on remotely sensed data continues with the implementation of the project management system in three Field Offices in 1997. The remainder of the system development will chain together existing PEDITOR modules. The programs will be studied to determine to what extent they can be changed to automatically alert the user to problems so that the user will look at considerably less output. As this is being completed, efforts to use enhanced statistical visualization and spatial analysis research will be considered.

Research staff are keeping abreast of various methods of survey data transmission, such as use of FAX technology and optical scanners, voice recognition, and computer assisted self-reporting, including the use of such technologies as the Energy Information Administration's PEDRO system and the Bureau of Labor Statistics' Internet data collection efforts. Some of these methodologies would be pertinent for surveys of agribusinesses which are repeated on a regular basis. Others are more appropriate for longitudinal survey designs. The Agency's long range methodological plan will determine which technologies are most likely to be needed. Research will include a literature review of technologies being used by other agencies and businesses to facilitate respondents' willingness to respond to survey questionnaires. A small prototype may be developed once the methodology that appears most useful to NASS's applications has been identified.

NASS plans to use technology to move aggressively toward a virtual workplace. More significant achievements are anticipated with the installation of the WAN and with the maturing of video conferencing. Eventually the Agency expects to be able to use teams of staff from across the organization to tackle specific initiatives. These teams will operate as though they are in one location through the use of video teleconferencing.

Other anticipated uses of this technology include staff meetings, virtual Agricultural Statistics Board meetings and remote training. NASS conducts extensive in-house program and technology training each year. With the full implementation of remote training, made possible through video conferencing, NASS anticipates a major change in the way it conducts its own training program, reducing costs and improving critical staff utilization, which will result in a major return on investment.

The size of the Agency program increased significantly with the addition of the Census of Agriculture. Although the other basic program elements have remained the same, the way NASS fulfills its requirements has been changing. NASS is moving toward a client/server

relational data base environment for its transaction processing activities. Survey processing techniques will incorporate windows-based screen-driven edit, analysis, and summary tools which will feed data warehouses. These data warehouses will be the repositories of key Agency program data. They will feed application systems and serve as the primary information source for future decision making. Major data warehouses include the list frame of farm operators, the warehouse of Estimates and Indications, the Published Estimates, and a data base of historic farm-level data collected in previous NASS surveys. In addition to the program data, several data bases will be constructed to contain generic data used in the Agency's normal day-to-day business and its research activities. Other specific functional legacy systems are to be reengineered. These activities constitute a vision of the future called the "NASS Data System 2000."

Budgetary constraints will place greater emphasis on the use of technology in order to meet increased Agency program output. Implementation of distributed data base technology increases processing costs, but the resulting nonquantifiable benefits more than offset the investment worthwhileness. Some specific benefits anticipated in the future are:

- o Reduced respondent paperwork burden
- o Reduced redundant data collection and retention
- o Improved quality of estimates
- o Improved accuracy and timeliness of reports and releases
- o Increased productivity of personnel
- o Improved access to timely enterprise information
- o Increased sharing of NASS data in electronic form
- o Reduced maintenance of software systems.

Immediately following the completion of the 1997 Census of Agriculture, work will begin on converting the Census processing from the Department of Commerce system to the NASS system outlined above. This will be a major reengineering effort for the Agency, but the integration into the NASS architecture will go a long way toward yielding the savings envisioned when the Department took over the Agricultural Census.

The benefits as outlined above will directly benefit users of the information provided by NASS.

6. NASS IRM OBJECTIVES

The NASS IRM Objectives are documented on subsequent pages of this document. Some objectives were changed last year but none were significantly modified or deleted this year.

There is one new objective associated with the transfer of the Census to NASS. Status of NASS objectives include:

1. Objective Title: **Develop the NASS Data System 2000**

Status: Remains current.

2. Objective Title: **Enhanced Technology Architecture**

Status: Remains current.

3. Objective Title: **Enhance NASS Staff's Technical Capabilities**

Status: Remains current.

4. Objective Title: **Enhance Telecommunications Capabilities**

Status: Remains current.

5. Objective Title: **Enhance Data Accessibility**

Status: Remains current.

6. Objective Title: **Research New Technologies**

Status: Remains current.

7. Objective Title: **Reengineer the Agricultural Census and Related Programs**

Status: New to NASS.

1. Objective Title (1): DEVELOP THE NASS DATA SYSTEM 2000

2. Status:

Continuing.

3. Objective Statement:

Create relational client/server data bases and systems across multiple computer platforms, in a distributed fashion, for operational processing and data warehousing.

4. Strategy:

Client/server data base management system technology will serve as the cornerstone of the data warehouse environment. Applications will be converted or developed, based on that technology, using additional software tools as necessary for data analysis, display, etc. Systems analysts will determine the best data storage location for specific applications, based on volume, access patterns, security requirements, etc. Individual users, however, will view the data from all applications as a whole, without being concerned about where any particular piece resides. The first major application to be ported to this platform is the Enhanced List Maintenance Operations (ELMO) system. The NASS Estimates Database and the Historical Data Database will contain the remainder of the NASS statistical data.

5. Program Supported:

Agricultural Estimates Program
Statistical Research and Service Program
Census of Agriculture Program

This objective also supports Goals 1, 2, 4, 5, and 6 of the NASS Strategic Plan. The objective supports all seven Core Business Processes shown in Section 2.

6. Cross-Cutting or Interagency Program supported:

Pesticide Data Program and the Environmental Program

7. Background:

NASS has done an excellent job of retaining important historical data, but it is often not readily available to the Program Staffs for analysis and use. This initiative will solve this problem by defining a complete data architecture, the development of data warehouses, and new software systems to exploit these mechanisms.

8. Contact Name and Phone Number:

Mary Anne Cummins, Chief
Systems Services Branch
Systems and Information Division
202-720-7906

9. Major Milestones:

	<u>Start Date</u>	<u>Planned End Date</u>	<u>Actual End Date</u>
ELMO I Implementation	10/93	10/97	
Historical Reported Data Warehouse	9/95	6/98	
NASS Estimates Database	11/94	9/00	
ELMO II and Record Linkage	9/95	7/01	
Year 2000 Compliance	7/96	6/00	

10. Resources:

	Thru <u>FY97</u>	<u>FY98</u>	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03+</u>	<u>TOTAL</u>
Total Costs (000)	4,300	3,000	2,500	1,200	1,200	1,600	1,200	14,000
Staff Years	26	25	25	15	15	15	10	131

11. Acquisition Description:

The majority of the data base products will be acquired in FY'98 for installation in determined sites. Developmental and CASE tools will be acquired, as needed by NASS, to meet its growing developmental requests. Data base servers will be acquired as needed to maintain or improve performance.

Other software, such as Graphical User Interface tools, will be acquired, as needed, to assist users in running the systems or to make ad hoc queries will also be acquired as needed.

12. Departmental IRM Implementation Framework Area Supported:

Business/Customer Support
Information and Data Management
Application Information Systems
Delivery System

1. **Objective Title (2):** **ENHANCED TECHNOLOGY ARCHITECTURE**

2. **Status:**

Continuing.

3. **Objective Statement:**

To continue providing every NASS employee with a full range of processing technologies to support data entry, on-line data base processing, data capture, word processing, desktop publishing, publication-quality graphics, spreadsheet applications, statistical data analysis, and access to batch processing through standardized, multipurpose workstations and peripherals.

4. **Strategy:**

NASS has installed local area networks (LAN's) in the SSO's and Headquarters. Equipment will be updated as new technologies and software enhancements become available.

5. **Program Supported:**

Agricultural Estimates Program
Statistical Research and Service Program
Census of Agriculture

This objective also supports Goals 1, 2, 4, 5, and 6 of the NASS Strategic Plan. All core business processes identified in Section 2 are supported by this objective.

6. **Cross-Cutting or Interagency Program supported:**

Pesticide Data Program and the Environmental Program

7. **Background:**

NASS defined functional requirements for LAN hardware and software and issued an RFP to acquire LAN's for its State Statistical Offices and a Headquarters Support Office in 1989. The RFP resulted in an 8-year contract award to Sysorex Information Systems. Prior to this contract, the major hardware acquisitions in NASS offices had been for data entry equipment. RJE

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capability, and "stand-alone" personal computers. These devices did not easily share data within an office or with mainframe applications.

8. Contact Name and Phone Number:

Gary Zeller, Chief
Technical Services Branch
Systems and Information Division
202-690-2273

9. Major Milestones:

<u>Milestone</u>	<u>Planned Start Date</u>	<u>Planned End Date</u>	<u>Actual End Date</u>
Install Census Division LAN	1/97	2/97	2/97
LAN Technology Refreshment	10/89	10/97	
Server OS Upgrade	11/96	8/97	
Client OS Upgrade to 32 Bit Systems	10/96	5/98	
Server Hardware Upgrade	3/97	10/97	
Desktop Installation and Upgrade	1/92	10/03	

10. Resources:

	Thru <u>FY97</u>	<u>FY98</u>	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03+</u>	<u>TOTAL</u>
Total Costs (000)	0	2,500	2,000	2,000	2,000	3,000	3,000	14,500
Staff Years	0	10	10	10	10	10	10	60

11. Acquisition Description:

NASS plans to purchase hardware and software through new or existing government contracts.

12. Departmental IRM Implementation Framework Area Supported:

Business/Customer Support
Information and Data Management
Application Information Systems
Delivery System

1. Objective Title (3): ENHANCE NASS STAFF'S TECHNICAL CAPABILITIES

2. Status:

Continuing.

3. Objective Statement:

To maintain a highly competent staff knowledgeable in the application development tools used by the Agency and to keep the staff abreast of rapidly changing technologies.

4. Strategy:

The NASS ADP training thrust is active on many levels ranging from individualized training in specialty areas to a widespread IRM training effort covering the entire NASS staff. Generally, the goal of training is to provide data processing personnel with the knowledge they need to meet individual and Agency requirements. Several in-house training sessions are conducted by the NASS staff, either on-site or in the Headquarters Training Facility in Washington, D.C. National ADP schools are held approximately every 1½ years to keep the Field Office ADP staff abreast of the latest policies and procedural approaches to ADP in the Agency. NASS annually selects from one to three individuals to receive graduate-level training in computer technology from colleges and universities across the country. These individuals are usually admitted to the Graduate School in either Computer or Information Sciences.

With the installation of LAN's, NASS conducts extensive in-house training at each LAN location. These sessions are designed to teach the entire office staff the various IRM products selected for inclusion on the local area network. Training includes the use of word processing, spreadsheets, graphics, electronic mail, mainframe data base access, automated data collection, communications, and remote job entry. As additional applications are implemented, NASS will continue to train its staff in the use of these new applications.

NASS makes use of automated training techniques through VCR and computer-based training courses. Several computer-based training courses are purchased and installed on all NASS LAN's. Additional courses will be purchased as they become available. Some in-house development of computer-based training courses will also occur. Courses are developed on processing systems and certain administrative support functions. When the

technology matures. NASS plans to utilize PC-based video conference technology, utilizing the NASS WAN. This technology will allow NASS employees to receive firsthand training right at their workstations.

5. Program Supported:

Agricultural Census
Agricultural Estimates Program
Statistical Research and Service Program

This objective supports goal 6 of the NASS Strategic Plan and Core Business Process #5. (Core Business Processes are identified in Section 2.)

6. Cross-Cutting or Interagency Program supported:

Pesticide Data Program and the Environmental Program

7. Background:

The rapid changes in IRM technology makes maintaining a highly trained technical staff more difficult. NASS continually reviews and updates the various technology platforms used in the Agency, making an enhanced training effort necessary.

8. Contact Name and Phone Number:

Gary Zeller, Chief
Technical Services Branch
Systems and Information Division
202-690-2273

9. Major Milestones:

	<u>Start Date</u>	<u>Planned End Date</u>	<u>Actual End Date</u>
LAN Administrator Training	2/97	2/97	2/97
1997 Systems Services Workshop	3/97	10/97	
LAN Administrative Training	11/98	11/98	

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LAN Reviews	10/94	0/02
1999 Systems Services Workshop	3/98	3/99
Implementing Video Training Systems	9/98	12/01

10. Resources:

	Thru <u>FY97</u>	<u>FY98</u>	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03+</u>	<u>TOTAL</u>
Total Costs (000)	3.300	200	500	400	400	400	450	5.650
Staff Years	64	2	4	3	3	3	3	82

11. Acquisition Description:

Video training
Computer based training
Vendor provided training

12. Departmental IRM Implementation Framework Area Supported:

Information and Data Management
Program Management

1. **Objective Title (4): ENHANCE TELECOMMUNICATIONS CAPABILITIES**

2. **Status:**

Continuing.

3. **Objective Statement:**

To provide connectivity of interagency and intra agency facilities for voice and data transmissions through the use of FTS2000 services. This may include switched voice, packet switched service, and switched digital integrated services.

4. **Strategy:**

To meet its future distributed processing intentions, NASS installed a high-speed data communications network connecting all NASS locations. This provides the communications link required to transmit large volume files between locations and to develop on-line applications. NASS plans to take advantage of the USDA Enterprise Network Services when it becomes available. NASS has played an active role in the development of the strategy for a USDA Enterprise Network. We are in the process of developing a Network Management and Security plan.

5. **Program Supported:**

Agricultural Census
Agricultural Estimates Program
Statistical Research and Service Program

This objective also supports Goals 1, 2, 4, 5, and 6 of the NASS Strategic Plan and all Core Business Processes shown in Section 2.

6. **Cross-Cutting or Interagency Program supported:**

Pesticide Data Program and the Environmental Program

7. **Background:**

In the past decade, NASS has utilized a combination of facilities and vendors to provide its telecommunications needs. Voice services were provided by the Federal Telephone System

(FTS2000), local IN WATS services, or special State arrangements where these facilities were not available.

8. Contact Name and Phone Number:

Gary Zeller, Chief
 Technical Services Branch
 Systems and Information Division
 202-690-2273

9. Major Milestones:

	<u>Start Date</u>	<u>Planned End Date</u>	<u>Actual End Date</u>
WAN technology upgrade	10/95	3/98	12/96
WAN technology refreshment	10/97	9/03	
Desktop Video	6/98	10/99	
Network Security (Firewalls)	8/97	3/98	

10. Resources:

	Thru <u>FY97</u>	<u>FY98</u>	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03+</u>	<u>TOTAL</u>
Total Costs (000)	1,100	750	1,000	1,000	1,100	1,100	1,200	7,250
Staff Years	2	1	2	2	2	2	2	13

11. Acquisition Description:

Hardware and software needs will be procured from new or existing government contracts.

12. Departmental IRM Implementation Framework Area Supported:

Business/Customer Support
Information and Data Management
Delivery System

1. Objective Title (5): ENHANCED DATA ACCESSIBILITY

2. Status:

Continuing.

3. Objective Statement:

To enhance data users accessibility and usability of NASS data through the use of telecommunications, open systems technologies, and mass storage and retrieval systems. To use emerging technologies to make outside information sources more accessible and usable to NASS.

4. Strategy:

NASS is investigating and implementing technologies and programs which provide more information in a timely and more user-friendly format. This includes, but is not limited to, the use of Internet, FAX On-Demand, CD-ROM, and other high-density storage technologies. NASS will continue to promote data sharing through cooperative efforts with other agencies and private industry. Examples of cooperation with other agencies include FSA, AMS, APHIS, WAOB, and ERS.

5. Program Supported:

Agricultural Estimates Program
Statistical Research and Service Program
Census Program

This objective supports Goal 6 of the NASS Strategic Plan and Core Business Processes 4, 5, and 7. (Core Business Processes are shown in Section 2.)

6. Cross Cutting or Interagency Program supported:

Pesticide Data Program and the Environmental Program
Agricultural Statistics Program

7. Background:

Many technologies are already in place in NASS for the electronic exchange of data with outside organizations. NASS has entered into a cooperative agreement with Cornell University to provide reports and data products over Internet which is available to data users at no charge. NASS is a major supplier of information to the Department's Computerized Information Delivery Service (CADS) where data users can obtain the data at a fee to the vendor. In addition, new development is occurring on screen driven systems utilizing fully distributed data base technologies. Once information is placed in the data base structure, its potential for being shared and electronically exchanged with other agencies is enhanced significantly.

NASS developed and has an operational Home Page on the USDA Internet server. Also, a "standard" home page was created and is being tested by two SO's. These files reside on the USDA Internet server. In addition, several of the State Statistical Offices have home pages through cooperative arrangements.

8. Contact Name and Phone Number:

Bill Pratt
Chief, Information Services Branch
Systems and Information Division
202-720-7017

9. Major Milestones:

	<u>Start Date</u>	<u>Planned End Date</u>	<u>Actual End Date</u>
Test and operation of optical imaging storage and retrieval technologies	7/96	12/99	
Internet Server	4/96	11/96	
Cornell University Agreement to provide national estimates on Internet	10/94	9/00	
NASS Historical Published	10/96	9/98	

NASS LR IRM PLAN FY 98-02

Estimates available on Internet

Publish Census Data		3/99	12/99
Provide electronic subscriptions of State reports	8/95	7/97	4/97

10. Resources:

	Thru <u>FY97</u>	<u>FY98</u>	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03+</u>	<u>TOTAL</u>
Total Costs (000)	700	300	500	300	300	300	300	2,700
Staff Years	6	3	5	2	2	2	2	22

11. Acquisition Description:

- Optical storage and retrieval devices
- CD Rom Production Contracts

12. Departmental IRM Implementation Framework Area Supported:

Business/Customer Support
Information and Data Management
Application Information Systems
Delivery System

1. Objective Title (6): RESEARCH NEW TECHNOLOGIES

2. Status:

Continuing.

3. Objective Statement:

Conduct research into applications of new technologies, directed to improving NASS operational procedures and programs by improving data quality, timeliness, and cost efficiency of agricultural statistics; and to develop new products which enhance existing Agency programs.

4. Strategy:

NASS is actively seeking out, evaluating, and, when appropriate, applying the most promising and accessible technology advances, especially those which relate to information processing. Many of the potential applications involve initial proof-of-concept studies.

Earth resources satellites with medium- to high-resolution sensors collect large amounts of information which can be used to estimate crop acreage. Image processing and GIS methodologies can be combined to accomplish this task. Lowered processing costs and increased flexibility of these methodologies have aided the integration of data from new sensors and allowed new approaches and products. NASS has a unique advantage with its operational area frame sample to statistically measure accuracy of satellite assisted crop area estimates. County and sub-state estimates of crop acreage with measurable precision and color theme maps showing crop location are examples of products from this technology. This can also be used to create a digital, spatially referenced cropland data layer in major crops states for the National Spatial Data Infrastructure (NSDI). Preliminary work has begun on an expert system for satellite image processing which can be used in the Field Office LAN environment to generate crops estimates and/or digital GIS inputs.

Satellite sensors also deliver information usable for crop condition assessment and crop yield estimation. NASS is currently loading products based on biweekly low resolution weather satellite data for graphical display of general crop condition to its Internet web site. This low resolution data has proven useful in monitoring widespread results of flood, freeze and drought conditions. Through a cooperative agreement with Purdue University, NASS is evaluating crop yield data on Precision Farming technologies.

5. Program Supported:

Agricultural Estimates Program
Agricultural Census Program
Statistical Research and Services Program

This objective supports all goals of the NASS Strategic Plan and Core Business Process #7. (The NASS Core Business Processes are shown in Section 2.)

6. Cross-Cutting or Interagency Programs supported:

USDA Remote Sensing Coordination Committee (RSCC)
USDA Weather and Climate Coordination Committee (WCCC)
USDA Agricultural Geographic Data Committee (AGDC)
Federal Geographic Data Committee (FGDC) -- Subcommittee on Vegetation GIS
Data Layer
Pesticide Data Program and the Environmental Program
Interagency CASIC Committee of Managers (ICCM)
National Aerial Photography Program (NAPP)

7. Background:

New and advanced technologies such as aerospace remote sensing, expert statistical systems, geographic information systems, computer assisted data collection and editing, and interactive statistical and graphical data analysis offer benefits to the NASS programs. The use of these technologies hinges on cost efficient hardware systems and user friendly application software systems.

8. Contact Names and Phone Numbers:

George Hanuschak
Associate Director
Research Division
703-235-5218 extension 105

9. Major Milestones:

	<u>Start Date</u>	<u>Planned End Date</u>	<u>Actual End Date</u>
Geographic Information Systems Applications			
MapInfo Applications for Field Offices	2/97	6/98	
Review Purdue Precision Farming Database	8/96	10/98	
Remote Sensing Based Crop Acreage Estimates			
AR, ND, and SD Crops	3/97	12/97	
Expert System	01/95	12/98	
NSDI Data Layer	10/97	12/00	
Computer Assisted Self Reporting			
Feasibility Research	06/96	6/97	
Prototype	10/97	9/98	
Small Pilot	10/98	9/99	
Large Pilot	10/99	9/00	

10. Resources:

	<u>Thru FY97</u>	<u>FY98</u>	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03+</u>	<u>TOTAL</u>
Total Costs (000)	3,000	1,300	2,300*	2,300*	2,200*	2,200*	2,100*	15,400
Staff Years	70	9	10	10	10	9	8	126

* Assuming Cropland Data Layer NSDI budget initiative (FY99) of \$1,000,000 is approved.

11. Acquisition Description:

Maintenance cycle for analysis system workstations and high end desktops for intensive processing of remotely sensed data and geographic information system applications.

Other equipment for technology research, such as concept studies, yet to be determined.

12. Departmental IRM Implementation Framework Area Supported:

Business/Customer Support
Information and Data Management
Application Information Systems
Delivery System

1. **Objective Title (7):** MIGRATE THE NATIONAL CENSUS OF AGRICULTURE
OPERATING SYSTEMS TO NASS

2. **Status:**

New.

3. **Objective Statement:**

Design and develop Census of Agriculture Systems to be completely integrated with NASS Systems.

4. **Strategy:**

All of the tasks needed to process the census program will be done within the NASS technology and computer environment. This will require an understanding of the census and the NASS environment to design and develop a comprehensive processing system.

5. **Program Supported:**

Census of Agriculture Program
Agricultural Estimates Program

This objective supports Goal 1 and 6 of the NASS Strategic Plan and the Core Business Processes 2, 3, 4, and 6, which are shown in Section 2.

6. **Cross-Cutting or Interagency Program supported:**

None

7. **Background:**

Although NASS has the responsibility for conducting the Census of Agriculture, processing of the 1997 census will require the utilization of the Bureau of the Census (BOC) computer systems. It also will require the support and staffing resources of several BOC divisions to accomplish tasks they had done in previous censuses. These include tasks like mail labeling, mail out, mail receipt check-in, data entry, edit review, TIPS, data dissemination, database and computer system support. Many pieces of the 1997 processing system are heavily based on software developed for the 1992 Census of Agriculture. It is

expected that these pieces will be redesigned and rewritten to integrate into NASS technology and reflect NASS's processing philosophies and goals. These include mail list development, analytic review, tabulation, disclosure and publication systems, coverage and error classification and weighting programs.

8. Contact Name and Phone Number:

Joseph T. Reilly
Acting Director, Census Division
Room 437, Iverson Mall
301-763-8557

9. Major Milestones:

	<u>Start Date</u>	<u>Planned</u> <u>End Date</u>	<u>Actual</u> <u>End Date</u>
Develop Processing System for All Other Census Related Program Activities	8/97	10/99	
Develop Edit System and Imputation for 2002 Census	5/99	2/03	
Develop Data Review System for 2002 Census	12/99	7/03	
Develop Tabulation/Disclosure System for 2002 Census	2/03	11/03	
Develop Data Publication System for 2002 Census	5/03	2/04	
Migrate Files	3/99	3/00	

10. Resources:

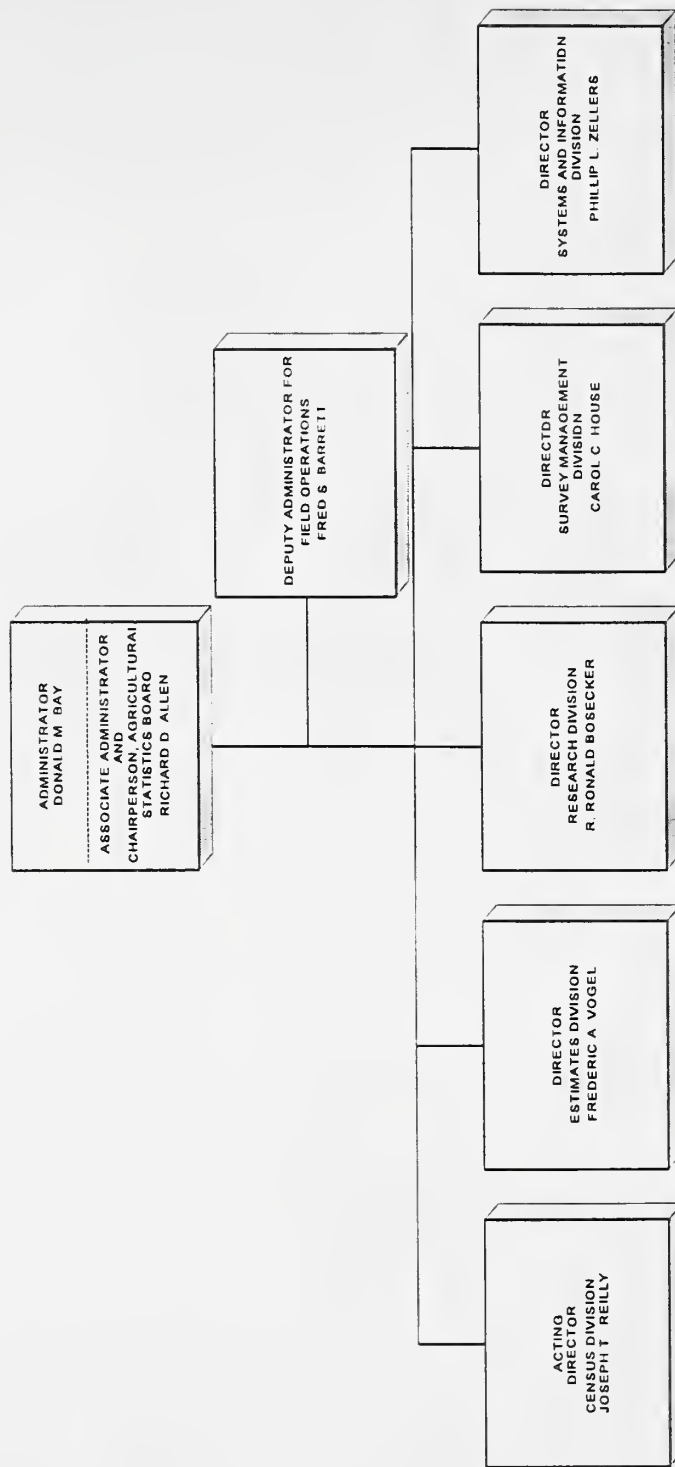
	<u>Thru</u> <u>FY97</u>	<u>FY98</u>	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03+</u>	<u>TOTAL</u>
Total Costs (000)	100	400	800	3,000	3,000	3,000	4,000	14,300
Staff Years	1	5	10	25	25	25	30	121

11. Acquisition Description:

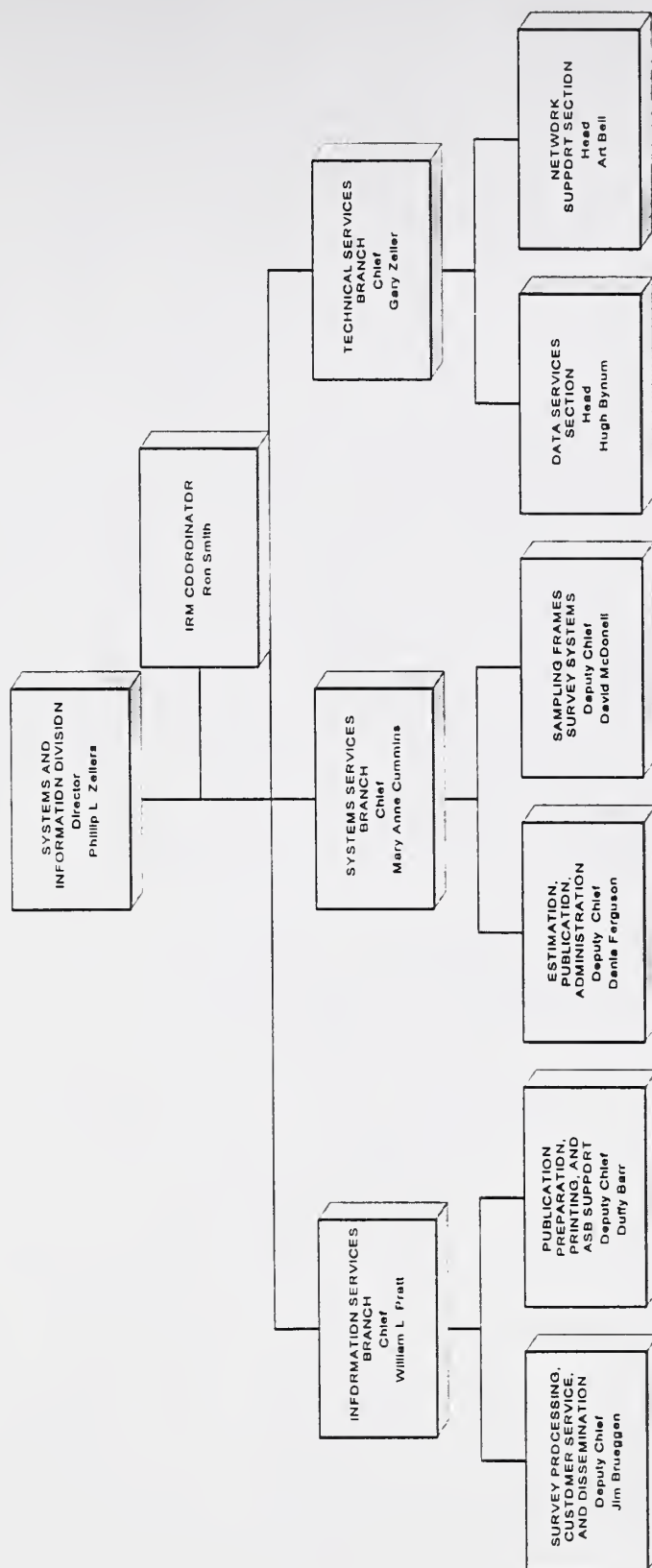
12. Departmental IRM Implementation Framework Area Supported:

Business/Customer Support
Information and Data Management
Information Systems

NASS ORGANIZATION STRUCTURE



SYSTEMS AND INFORMATION DIVISION ORGANIZATION STRUCTURE



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